

HE'S IN THE SUB-BUSTERS NOW

BY A. D. RATHBONE, IV

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HE'S IN
THE SUB-BUSTERS NOW



Surf-boat rendezvous, from the stern of the *U.S.S. Hunter Liggett*.

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By

A. D. RATHBONE, IV

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PRINTED IN THE UNITED STATES
OF AMERICA
FIRST EDITION

TO VAND
AIRBORNE

DEDICATION

TO THE OFFICERS AND
men of the United States Navy, to those of the Army's Anti-
submarine Command, to all other "sub-busters," whoever and
wherever you are, this book is dedicated with sincere respect and
admiration.

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ACKNOWLEDGMENT

TO BE PRIVILEGED TO visit wartime naval establishments where American boys are trained to hunt and sink enemy submarines is not only a high honor, but also an experience that will be cherished for years to come. To be permitted to live with these lads, to "chow" with them, attend their classes, listen to them "shoot the breeze," and, above all, to be accepted by both enlisted personnel and officers as "one of the gang," is something I could wish might be the lot of all of us. There is much to be gained and much to be learned.

In this attempt to draw a word-picture of the "sub-busting" activities of the United States Navy and of the Army's Anti-submarine Command, I have endeavored to describe what it means and feels like to be a potential "sub-buster." The thoughts, desires, actions, and reactions of men at war are not easy to put into words. I know, for as one of them, I tried it in the last war. This time it is even more difficult.

However, if the pages of this book succeed in presenting some semblance of what our present-day naval fighting men are like, if all these words help you to conceive what it means to learn how to go to war against Nazi and Jap U-boats, what a tremendous amount of "know-how" and "can-do" is necessary to carry that job through to a successful conclusion, they will have fulfilled their purpose.

The term "sub-busters," as used in this book, is an all-inclusive one. To me, it means primarily the officers and the crews who

man both ships and aircraft engaged in the battle against the submarines. It also has been used to indicate the vessels, the planes, or the blimps themselves. Such rather loose designation is, I trust, pardonable under the circumstances, and I sincerely hope that Army and Navy men will realize it is a coined phrase denoting high esteem.

For invaluable assistance, suggestions, data, and all the illustrations, I am deeply grateful to the United States Navy. For permission to reprint Chapter 16 from *Scientific American* where it originally appeared, I am sincerely appreciative. My thanks likewise go to *This Week Magazine* for use of material which is incorporated in Chapter 5, and to *The American Legion Magazine* for a portion of Chapter 20.

A. D. RATHBONE, IV.

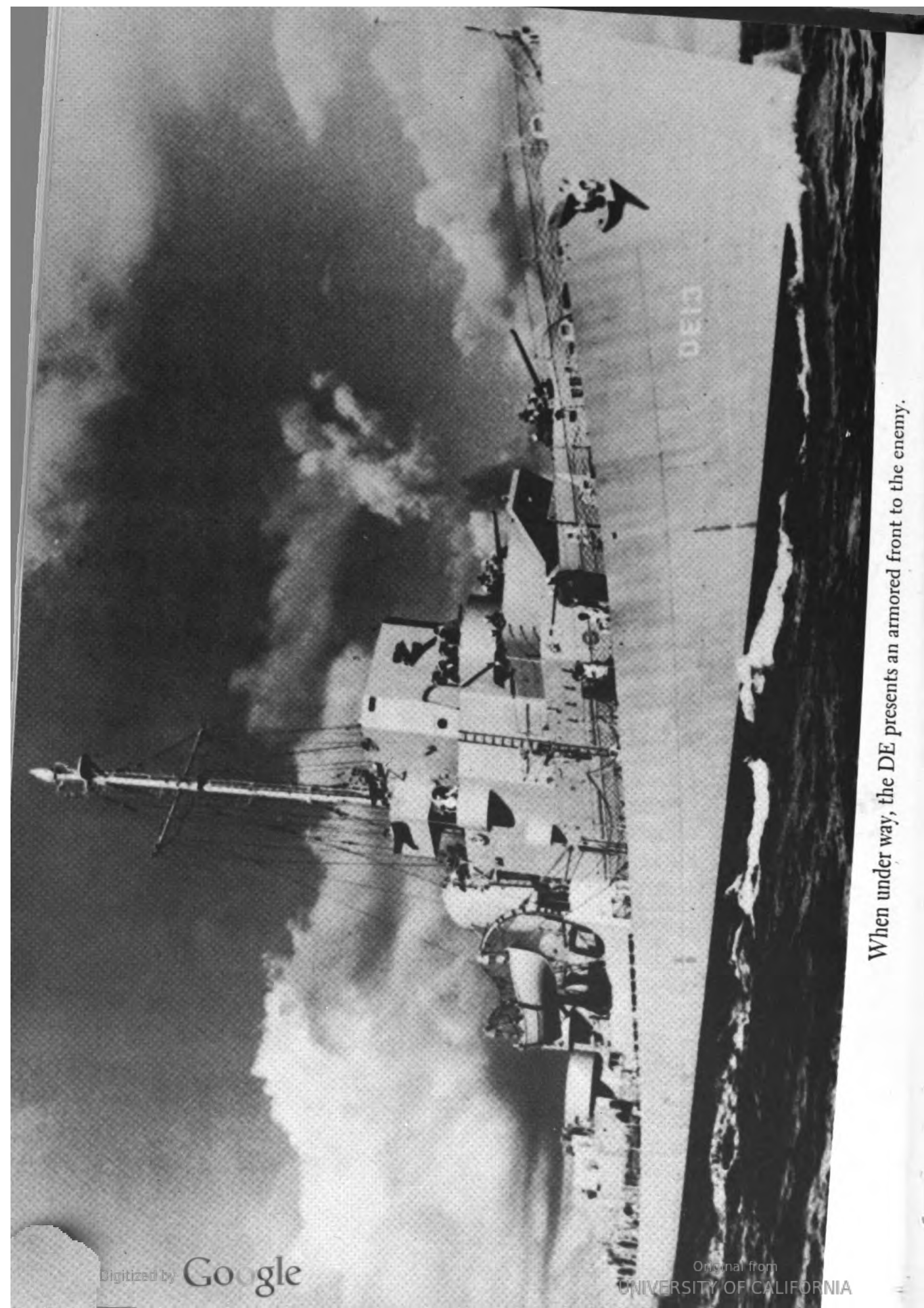
Chappaqua, New York.

August 9, 1943.

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HE'S IN
THE SUB-BUSTERS NOW



When under way, the DE presents an armored front to the enemy.

Chapter One

THE U-BOAT MENACE—WORSE
THAN YOU THINK

WITH ALL THE SPEED AND skill our inherent American ingenuity and driving force can muster, we are building the greatest fleets of seagoing and aerial sub-busters the world has ever seen. We are intensely and thoroughly training tens of thousands of our finest and sturdiest young men to man these armadas of the sea and the sky—to go forth and blast the submarine menace from the seven seas. That is a large, but necessary, order.

It is large because the Germans are said to possess between 400 and 500 "Unterseebooten," of which at least a third are on patrol at all times. Furthermore, it is believed the Nazis are constructing from 15 to 30 new subs each month.

It is necessary because we know we cannot win this war unless we maintain constant overseas streams of men, munitions, and materials transported in hundreds of cargo vessels and protected by scores upon scores of fighting ships and aircraft. By the same token, the Germans are aware that, to insure a Nazi victory, those Atlantic supply lines of ours must be cut, and it is the business of Hitler's huge fleet of submersibles to do just that. Thus, our battle against enemy submarines becomes the most critical fight of the war.

Actually, this fight has been going on bitterly since September 11, 1941, nearly three months prior to Pearl Harbor. On that day, in his famed "shoot-on-sight" radio address, President

Roosevelt declared: "From now on, if German or Italian vessels enter the waters, the protection of which is necessary for American defense, they do so at their own peril . . . The orders which I have given . . . to the United States Army and Navy are to carry out that policy—at once." Although some of our ships had been sunk before this ultimatum, it was not until December 8 of that year that the Germans cut loose against American shipping and American warships with the full force of the undersea craft at their command, and in the beginning we got pretty much the worst of it.

Soon after the Japs landed their sneak-punch in our Hawaiian solar plexus, the Nazis started hitting our merchant marine below the water line in coastal lanes as well as on the high seas—and momentarily there was little we could do about it. We had neither ships nor men to man them. All our destroyers, generally conceded to be one of the submarine's deadliest enemies, were needed everywhere at once.

All hell was loose in the Pacific, and as attacks on Atlantic and Gulf coasts by a Nazi battle fleet weren't considered likely or even possible, battleships, cruisers, destroyers, and other major warships were largely in other parts of the world. Our problem was twofold: first, to drive the subs far out to sea, which could be done by adequately patrolling the coasts. Second and simultaneously, to plan and put into earliest possible effect an all-out campaign which, when in full motion, would completely and utterly eliminate the submarine menace.

Meanwhile, the German submersibles promptly took advantage of the situation and began sinking freighters right and left, many within sight of our shores. To establish an Inshore Patrol which would put the quietus on this audacious practice would require boats, more boats, and still more boats—and thousands of trained men to man them. The manpower problem showed immediate signs of self-solution. Potential sailors and officers



In PT-boat fighting, you often sneak so close to the enemy that "you can spit on him." Then "Tommy-guns" come in handy.

Gunnery men take down and re-assemble their guns to the last nut and bolt.

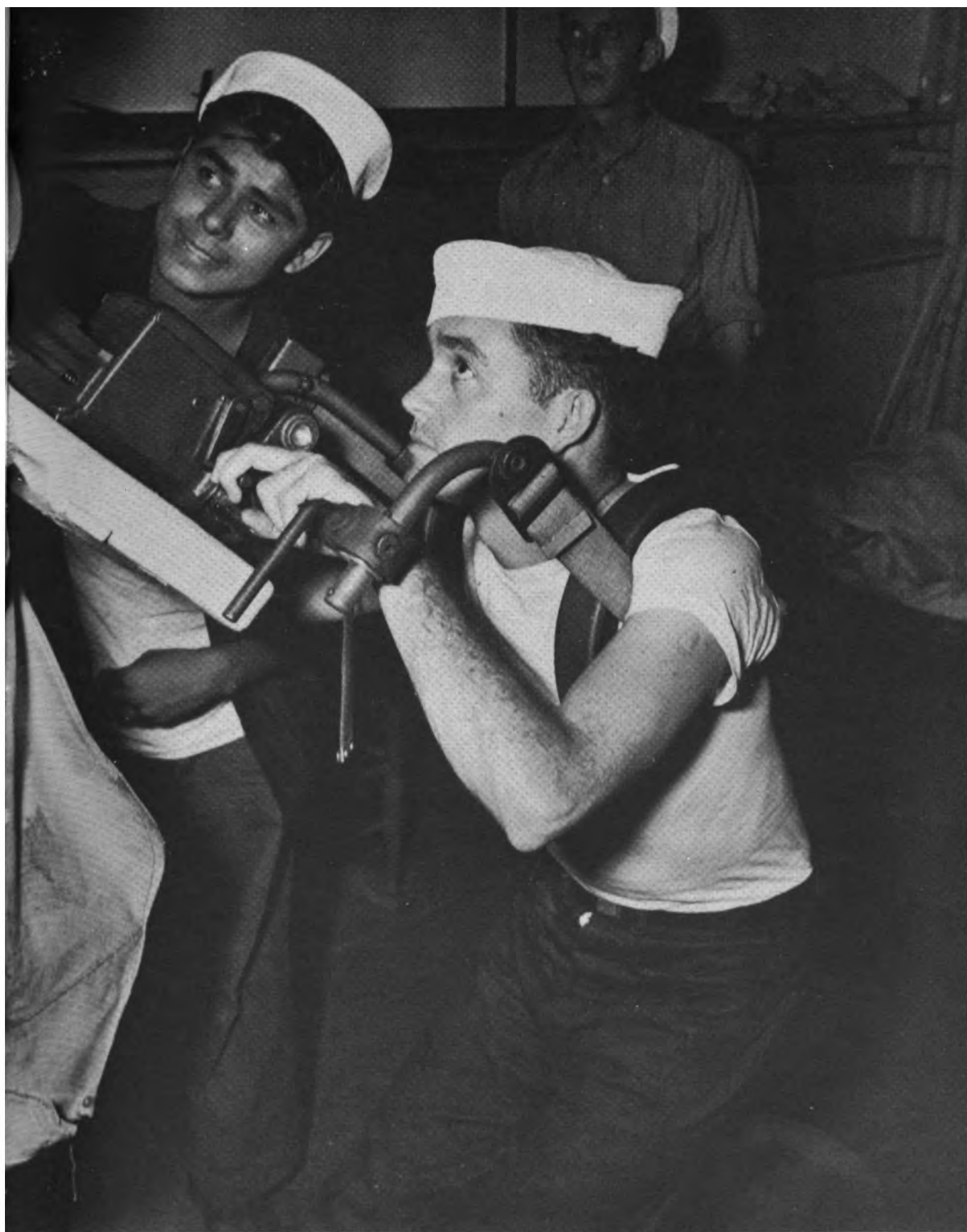


poured into recruiting stations faster than they could be cared for, but the ships for this new Navy—where were they?

Early in 1941 miracles were being wrought in American ship-building yards, but not even miracles could produce with sufficient rapidity enough small, speedy craft capable of guarding all our coastal shipping lanes, to say nothing of the larger, more heavily armed ships needed for Atlantic patrol. The demand for ships for this dual job of coastwise and transoceanic protection was imperative—*now*—had been so for weeks—and tomorrow or next month just would not do. To overcome the problem of coastal protection and drive the subs out to sea, the Navy adopted the same tactics it followed in 1917 when faced with a similar dilemma on a smaller scale. Scouts who knew good ships when they saw them explored coastal harbors, peered into yacht basins, and poked their noses around every mooring where it was conceivable that usable, seaworthy boats might be found.

From this naval dragnet came as conglomerate a collection of craft as those that braved Dunkerque's dangers, but with repairs, paint, and such armament as was available, they could be made to serve temporarily. Amateurish and hectic though the new marine coastal defenses were in the face of the professional and long-planned German attack on coastwise shipping, our hastily formed "Dungaree Navy" did a remarkable job. Ably aided by an equally hurriedly established air patrol of the near-by waters, that heterogeneous collection of small ships, including a number of British corvettes loaned to us, succeeded in driving the U-boat from its impertinent and devastating invasion of American coastwise shipping.

However, this was not sub-busting in the best sense of the word. It was far more defensive than offensive and resulted only in chasing the U-boats out to sea, where they could and did attack the transocean shipping to an even greater degree than before. Only part of the battle with the U-boats was won, and it

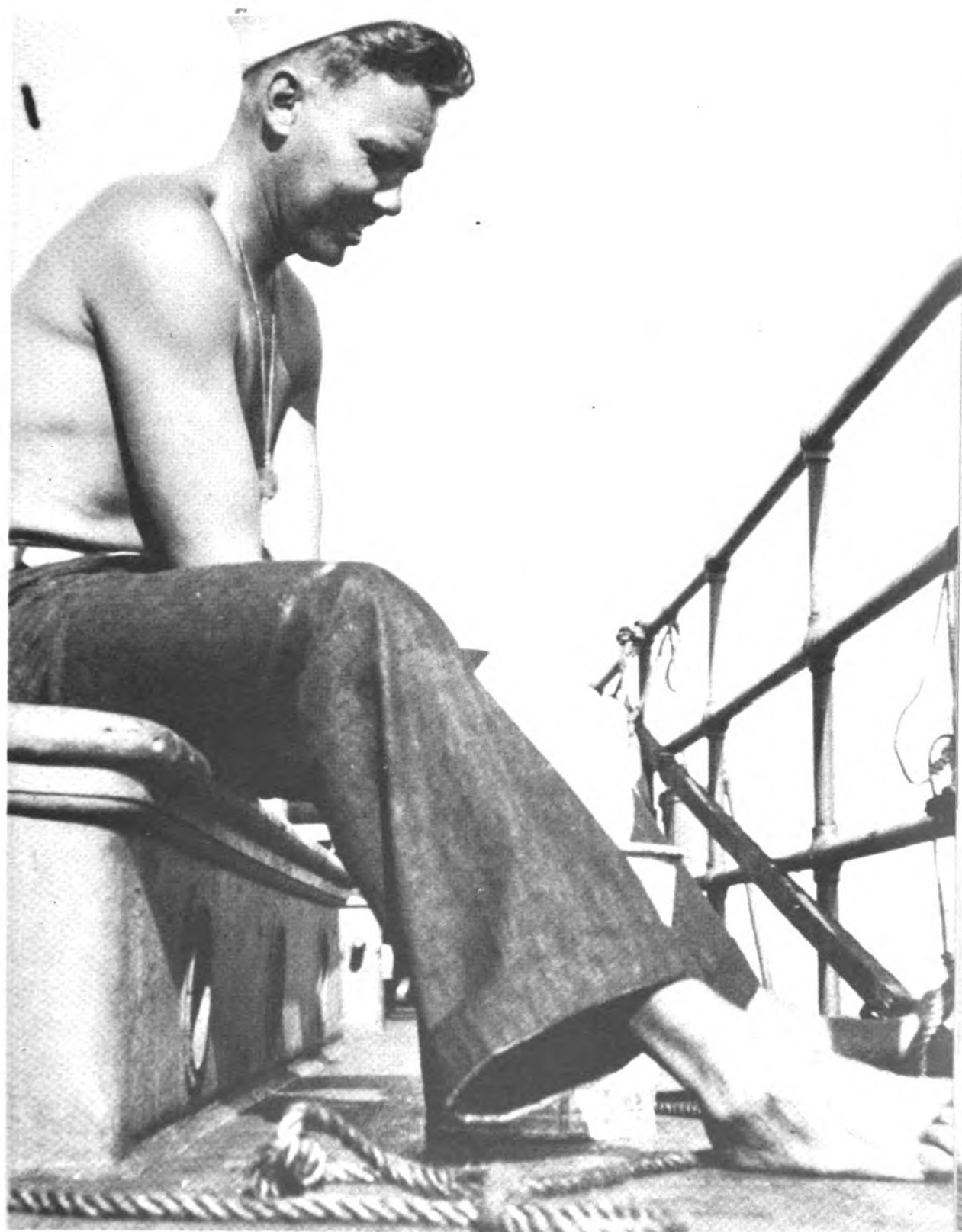


Strapped in, and with left hand on the trigger, the gunner "gets the feel" of a 20-millimeter machine gun.

was by far the smallest and easiest part. The second, and most important phase of the job, the elimination of the submarine, is still to be accomplished.

Preparations in general for this tremendous effort were under way months before we entered the war, but, again, it was a question of ships, men, and armament. During 1942 amazing progress was made in overcoming those difficulties, and by April of 1943 the first indications of America's new strength in anti-submarine weapons were visible in the reduced sinkings of freighters and in the increased bag of Nazi subs. Although this, in itself, brought a silver lining to the dark clouds of unrestricted submarine warfare, a Herculean task remains to be done. Titanic forces are today engaged in a clashing struggle. There are still about half a thousand of Hitler's U-boats in action, and new ones continue to come off the German assembly lines every month. Nevertheless, while our sub-buster campaign is not yet under full steam, it is in action.

What that campaign is, how it was evolved and put into practice, what results have been attained to date, and what may be expected from the future comprise one of the most thrilling stories of the war. It is the story of the making of sub-busters—those lads who so vigilantly are hunting down and disposing of our deadliest enemy. From every corner of the nation they come; from hamlet and crossroad, from big city and farm. Some are training for service on PT-boats, some for other patrol craft, some for aircraft service, and many thousands of new sailors will find their sea-legs in the recently inaugurated and greatly-to-be-expanded Destroyer Escort service. All are vital factors in the greatest sub-busting program ever conceived. It will be their grim business to win the battle that will win the war—the battle with the submarines.



Jack Tar does his weekly washing aboard a Splinter Ship.

Chapter Two

MEN FOR THE "EXPENDABLES"

THERE ARE ONLY TWO kinds of PT-men—the quick and the dead. If they're not quick enough, they're dead." These brusque words were spoken by Lieutenant T. R. Stansbury, Senior Instructor at the Motor Torpedo Boat Training Center at Melville, Rhode Island, not in any attempt to be brutal or to exaggerate for emphasis, but because the thought they express is the unadulterated, bald-faced truth. One has only to read William L. White's inspiring saga, *They Were Expendable*, to realize that the Motor Torpedo Boat Service—popularly known as PT-boats, or mosquito boats—calls for men who have much to give, and takes all they have, and more.

It is not sufficient merely to say that if a man desires to become an officer or a member of the crew of a PT-boat, he must be rough and tough. That helps, but instantaneous and cat-like co-ordination of mind and muscles, such as that developed by top-notch athletes, is probably even more important. No lad, either now in service or about to enter, who thinks he would like to be a PT-man should give the idea a second thought until he has thoroughly analyzed himself for the qualities and characteristics needed for this grueling and dangerous work. Besides a strong body and mind, he must be able to be supremely audacious and daring at the proper moments; to put it plainly in inelegant but expressive language, he must have an unmitigated amount of guts. But above all else, he must understand to the nth degree

what teamwork means, and be able to both subordinate and co-ordinate himself to the welfare of his crew-mates and officers.

What all that means in real life can best be described by an experience that happened to a PT-boat and its crew during the fighting off the Solomon Islands. One November night Lieutenant (j.g.) Leonard Nikoloric took his mosquito boat out to look for a flotilla of Japanese warships known to be in near-by waters. The PT crept slowly through the black night with muffled motors. Every man aboard was at his station, eyes and ears straining into the darkness to locate the enemy. Nobody knew exactly where the Japs were or what their strength was. The tension was terrific.

Suddenly two blinding shafts of light shot through the curtain of blackness and picked up the cautiously cruising Mosquito. It was the Japs. They had found the PT before it found them and in less time than it takes to tell about it, they cut loose with a salvo from their 4.7 guns. The two shots straddled the little ship but there were no casualties. Instantly the Japs fired a second salvo, and this time the shells came so close that every man aboard was knocked flat by the concussion.

No one was hit, but Lieutenant Nikoloric and his executive officer were stunned into unconsciousness and the entire crew was thoroughly dazed. For a few seconds the pilotless Mosquito buzzed head-on into the glaring searchlights, a perfect target. Then John Der, Machinist's Mate, got groggily to his feet. Momentarily he couldn't recall what had happened, but his foggy brain told him there had been an explosion.

Der's mind worked mechanically and his muscles reacted automatically. In his hazy thoughts explosion meant noise, noise signified torpedo, and as Machinist's Mate, it was his business to fire one of them. He looked at the tube. The tin fish was still there. He smacked the percussion cap which started the torpedo on its run. That tin fish went straight for a Jap ship and blasted it.

Meanwhile, up on the bridge, Quartermaster John Legg came to and staggered to his feet. He, also, was in a momentary fog, but not too hazy to sense what was wrong. Stepping over the prostrate lieutenant, he grabbed the wheel and threw it hard over, making a sharp turn.

In the after cockpit Leon Nale had clambered back to his machine gun just as the boat began to swing around. Those searchlights made him mad, so he gave them both a burst and knocked them out. Crosson remembered smoke valves, banged them open, and set up a protective smoke screen. Pearle got back to his post on the radio, Carner and Porterfield went to work on the motors, and as the ship sped away to safety, the two officers regained consciousness. The whole thing had happened so fast that only when it was over did the men realize what they had accomplished.

This is no attempt to glamorize the men already in the PT-boat service, men like Lieutenant Commander John D. Bulkeley, Lieutenant Robert B. Kelly, Ensign George E. Cox, Jr., Ensign Anthony B. Akers, and the rest of the PT-officers and men of Bataan fame, or those scores of other mosquito boat crews who helped take Guadalcanal, who fought at Midway, or in fogs of the Aleutians, and in many other war sectors. It is a plain, simple, unvarnished fact that unless a man has what it takes, he has no business applying for service in a Motor Torpedo Boat squadron. As for the glamor of this branch of the United States Navy, there is none. Unfortunately, many of the earliest newspaper and magazine pictures of and articles on the speeding little ships lent an aura of the thrill of motorboat racing. Unintentionally, some writers and photographers dressed up the PT-service in a sort of circus or Hollywood atmosphere which made it seem, in the minds of many, that it would be glorious sport to ride the crests of the waves at 50 to 60 miles an hour, that the speed and maneuverability of these racy craft made them an

almost impossible target for enemy guns and bombs, and that it would be real fun to take one of them into battle. None of this is true. Most of the pictures were taken of trial runs on relatively calm waters. Most of the articles were written about the same trips. The cold facts show there have been casualties in mosquito boat service. When a PT-boat suffers a direct hit from an enemy shell or torpedo, there's little use in looking for survivors.

Lieutenant Commander W. C. Specht was at Pearl Harbor with MTB Squadron One, which was credited with downing six Japanese bombers during the height of the battle. Shortly afterward he was ordered back to this country to establish and take charge of the Training Center at Melville. Commander Specht is ably suited for his job. He knows what his trainees are going into, what they will face when the shooting starts. He knows the kind of men the service needs and the only kind who can stand the gaff. In a recent address to a class of officers and men who were just starting their training at Melville, he said:

"You officers and men may not appreciate this fact, but you are about to have a privilege which is accorded to only a selected few.

"There are vast numbers of young men throughout the country and in the Fleet today, who would give a great deal to have the opportunity which you have now—that of qualifying yourselves to operate and fight the finest Motor Torpedo Boats that the world has ever produced.

"The fact that you have volunteered for this service indicates that you have at least two of the basic qualities which are essential for success in these boats—one of these being a strong desire for this type of duty, and the other—confidence in your own ability to cope with the requirements.

"The standards and requirements for Motor Torpedo Boat duty are necessarily high.

"They have to be. There is no branch of the service today—

aviation, submarines, destroyers, or any other type—that requires the high degree of personnel specialty as that required in these boats.

“EVERY officer and EVERY man on board each of these small, fast craft must not only have a thorough knowledge of his own duties, but must be completely familiar with the duties of every other man on board.

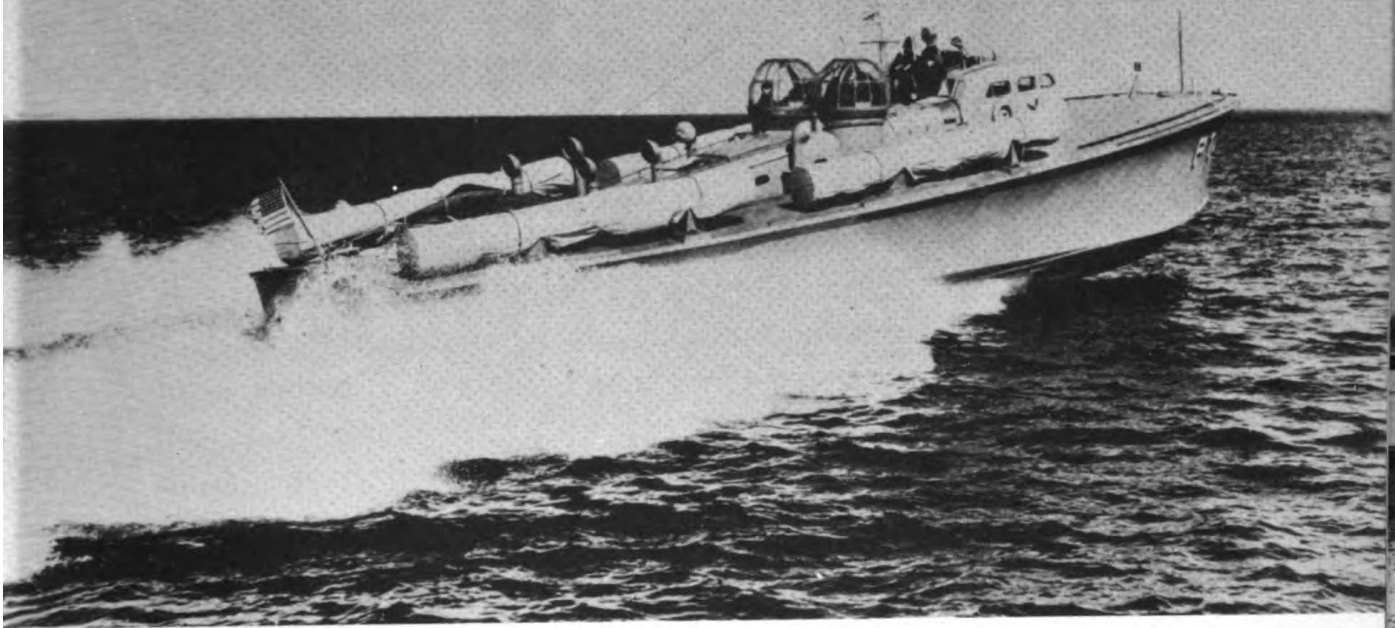
“This is because there are only two officers and nine men in the crews of these boats, and each crew must be a well-trained and well-organized eleven-man team. And also because, when the whistle blows and the game starts, there will be no substitutes or coaches on the bench. If a player goes out, a teammate must take over this vacant job, as well as his own.

“The game is being played against professionals, and the stakes are pretty high. In order to be in on the finish, we have to play some pretty good ball!

“It’s our job to do the coaching now and to see that only first-string material goes into these teams. In the Motor Torpedo Boat game, there is no place for second-stringers . . . This duty which you have chosen, or has been chosen for you, is hard, rugged, and tough and will require the same qualities of you. We are strict in our requirements. We will expect a great deal of you. But no more than you are capable of producing.

“I sincerely hope that in two months’ time—when you have completed your course of training—each and every one of you here today will have proven emphatically your ability to join and become a part of the finest and the toughest striking force that the Navy has ever produced—the most dependable, unexpendable Motor Torpedo Boat Squadrons.”

That phrase, in “two months’ time,” is far more meaningful than the words would imply. It is a simple way of stating that when a man enters the PT-school, he embarks on one of the stiffest, most intensive courses of naval education ever devised.



Some PT's mount four torpedo tubes, others carry two and a line-up of "ashcans."

It's young men on the bridge of a PT. The skipper, right, is a lieutenant; others are ensigns.



He will, if he can stand it, assimilate more knowledge in the eight weeks at Melville than he has ever before tried to absorb in periods twice or three times as long. The first month will be devoted to classwork and theory. The second month covers practical application in various shops, aboard boats at dock, and on cruise, of what has been studied. There will be additional textbook work, possible attendance at special schools, and, for some, even actual labor in torpedo and other munitions factories.

The curriculum is divided into the four departments of Gunnery, Seamanship and Navigation, Communications, and Engineering. Each department has three brackets: The A, or Advanced Course; the B, or Primary Course; and the C, or Secondary Course. Every officer is given either the A or the B Course in all of the subjects. Each enlisted man is required to take the A Course in the subject of his Navy rating, and the B or C Course in all other subjects. For example, a Machinist's Mate must satisfactorily complete the A Course in Engineering, and either the B or C courses in Gunnery, Seamanship and Navigation, and Communications. These are part of the emergency provisions to fit every member of a PT-crew to take over the work of a shipmate, regardless of whether it be in the engine room, in the galley, up on the bridge, or behind a machine gun or torpedo tube. Besides all this, there is also practical instruction in First Aid, swimming, small bore rifle shooting, gas warfare, Judo for physical combat, the ever-present setting-up exercises, and other physical training to prepare bodies for the rigors of PT-duty. For officers, there is a special course in Administration. It's a busy place, is the Motor Torpedo Boat Training School at Melville, Rhode Island.

The first qualification for admittance to this select service, besides the characteristics previously enumerated, is youth. Men over 35 are definitely not wanted, and preference is strong for those not over 30. PT-men are young, but lack of years must be

compensated for by mental and physical strength. "If a young fellow has been kicked around some in his early years," said one instruction officer, "and still has plenty of fight in his system, we can usually use him."

All officers are volunteers, and from this group, which at present comprises more men than can possibly be utilized, the leaders of PT-crews are hand-picked. All must be college graduates, all must have completed the Navy's B-7 educational program, followed by the course offered at one of the midshipmen's training schools, such as the University of Notre Dame, Northwestern University, Princeton University, and Columbia University before they may be eligible for consideration as skippers and executive officers of PT-boats. That the quality and caliber of PT-officers must be high goes without saying. It takes ultra-strong leaders to be at the head of a crew of strong men. The officers who have thus far been graduated from Melville have compiled an enviable record of accomplishments. They have set a standard which the Navy does not intend to relax.

More than 85 percent of enlisted PT-personnel, or members of the crews, are volunteers, and all come from what are known as Navy "feeder schools" with high ratings in Class A. This means that even the newest sailor has had more than average Navy educational training before he may apply for service in an MTB Squadron. He has passed the original Navy enlistment requirements, has spent three weeks in a Detention Camp, where he studied "First Phases of Drill," "Instructions for Apprentice Seamen," and the "Bluejackets' Manual." While there he was taught infantry drill, the manual of arms, school of the squad, semaphore signals, setting-up exercises, physical drill under arms, boats, bag inspection, and personal cleanliness.

He then spent six weeks on the "Main Side" of the Training Station learning to row a boat, swim, how to tie knots and splice rope, and how to handle a rifle. He was likewise schooled in

elements of chemical and gas warfare, naval nomenclature, discipline, and personal hygiene. After a ten-day leave he was, assuming his service record and grades were satisfactory, eligible for one of the three Navy Schools.

If he had already made up his mind he would like to enter the PT-service, he would choose the A-School, which offers instruction in electrical subjects, ordnance, communications, and clerical work. The A-School also trains machinists, metalworkers, woodworkers, buglers, hospital corpsmen, and musicians. The would-be PT-man selects his specialized subject—which, in the mosquito fleet, won't be music, bugling, or clerical work—grinds away at it for sixteen weeks, and, with his certificate of graduation from the Bureau of Personnel, he is finally ready to apply for admittance to the MTB Training Station at Melville.

As for experienced enlisted men who may have been to sea, but who, at least, have had more than just the training of the new recruit, they, too, are eligible if they have had A-School work. However, they can make themselves even more valuable by going through the Navy B- or C-Schools, both of which offer advanced and specialized education in various branches.

In any event, it can easily be seen that nobody gets into the carefully selected Motor Torpedo Boat Service unless he has the educational groundwork to begin with. And he must have the mental ability and alertness to build up that basic groundwork until he can be classed as a sort of combined specialist and jack-of-all-trades, for he will know his own business from A to Z, and, for emergencies, the business of each of his specialist shipmates almost as well. Not only does "fighting a PT-boat" (as it is termed in the Navy) right under the enemy's guns call for unlimited courage, but also the preparation for doing so demands a stamina and a persistence far above average.

Chapter Three

MELVILLE, WHERE PT-MEN ARE TRAINED

MELVILLE, THE LOCATION of the Motor Torpedo Boat Training Station of the United States Navy, is on the eastern side of Narragansett Bay, that wide estuary of the Atlantic Ocean that extends back into the state of Rhode Island almost as far as Providence, the State's capital. Melville itself isn't much more than a crossroads, some nine miles inland from Newport, and about an hour's bus ride from Providence. The Station isn't visible from the main highway, and the first impression a new man receives on his arrival is that of a huge construction project, dotted with steam shovels, cranes, contractors' sheds, and no trees to speak of. The entire area is part of new naval facilities, of which the MTB Station was one of the first units, and the whole thing is surrounded by high fencing, with sentries at the gates.

After his papers have been checked at the sentry box, the new arrival travels about half a mile, until he reaches the brow of a hill. There, spread out before him along the shores of Narragansett Bay, is his new home from which, in eight weeks, he will graduate as a full-fledged member of a PT-crew. There are other Navy installations here, too, but what catches his eye is the little village of Quonset huts, those dome-shaped abodes of corrugated metal that now are housing American servicemen in all parts of the world. The parade ground is easily spotted by the large American flag at full staff, and the national emblem likewise

indicates the location of the headquarters buildings and offices. In the distance, dimly seen because of the trees, are the lagoon and the finger piers, where the PT-boats are tied up. Beyond, stretching for many miles, are the blue waters of the bay.

A faint, consistent roar reaches the ears of our PT-man who has just arrived, and looking off to the left he discerns the first mosquito boat he has ever seen in action. Slicing through the water at high speed, the racing ship knifes the blue Narragansett into two white ribbons which tie themselves together behind the stern of the ship into a broad, foaming wake. A mosquito boat looks very low in the water and broad of beam, yet the lines of the hull are graceful, and if ever a vessel was built for speed, it is the PT. There isn't much to the superstructure, just a low, slanting windshield across and in front of the bridge. The stubby steel mast rises directly aft, and the buggy-whip radio aerial bows backward with the fast forward motion of the ship. Further aft there is a low roof construction, running down the middle of the hull. This is flanked on either side by two elongated, dark-looking objects which any Navy man, even a relatively new one, would recognize as the death-dealing torpedo tubes.

After reporting to the Officer in Charge, the PT-recruit is assigned to quarters in a Quonset hut, where he makes the acquaintance of eight other new arrivals. He looks them over and sizes them up pretty carefully as he unpacks his sea bag. Barring illness or injury, these are the men with whom he will live and fight for the duration of the war, these are the members of the crew of his new PT-boat.

They all look husky, keen, and smart. Already they seem to have taken on an air of assurance, an attitude of confidence, partly due, no doubt, to the fact that the Navy thought well enough of their records to grant them an opportunity to become members of the Mosquito Fleet. One lad wears a Hash Mark, or service stripe, on his left sleeve, indicating his four years in



The feathery trail of a tiny target, as it would look to enemy airmen.

the Navy, as well as the insigne of a Gunner's Mate, second class. Another's uniform carries the specialty mark of a Machinist's Mate, a third that of a Signalman, and the rest are seamen with first and second class markings. All in all, a good-looking bunch of boys who, collectively and individually, radiate the impression that they can take care of themselves and that they would be good men to have around in time of trouble.

Immediately after breakfast the following morning all hands, new men and old, stand to for Colors and inspection. After a few brief announcements and orders of the day, the men who have been at the Station are dismissed to proceed with their classes and training. Officers and enlisted men who have just arrived to form the newest class to enter Melville stand at ease while they listen to words of welcome and wisdom from the Commanding Officer. Commander Specht is not a man to mince matters. Among other direct-to-the-point things, he says: "We have a rigid course of instruction which you are required to complete satisfactorily. We have other requirements which you must successfully meet. In the short period allotted, we cannot possibly produce proficient PT-boat officers and men without your utmost effort and co-operation. We can dish it out, and we can make you take it, but the real proof of the pudding rests with yourselves."

It doesn't take long to get the new men organized into classes according to their ratings. A fellow learns a lot at Navy "Boot Camp," and even the youngest man in point of service in the latest Melville contingent has been out of "Boot" for several weeks so, in a way, all are old hands, and things shape up smoothly. The group of newcomers will immediately become a unit, and will be assigned a number. Collectively, they will be known as "Motor Torpedo Boat Squadron 69," and one of the first things learned is that that rather lengthy cognomen is abbreviated to "MTBRON 69," and is pronounced "M-T-B

RON 69." A squadron is composed of 10 to 12 PT-boats, with 12 as the average number. The Squadron Commander fights his own ship, and each boat has a complement of nine enlisted men and two officers, the skipper and his executive officer. The latter two may both rank as ensigns or as lieutenants, or the skipper may be a lieutenant and the "Exec" an ensign. There is also a base force for maintenance and supply, likewise under the command of similar ranking officers.

MTBRON 69 soon acquires its own esprit de corps. It gets acquainted with itself and its officers rapidly, and in a few days comes to think of itself as the finest squadron ever to enter the Station. This, of course, is exactly as it should be, and that feeling of proper rivalry is fostered by the instructors, who, without any fuss and feathers, have started the new men in their courses of Gunnery, Communications, Engineering, and Seamanship and Navigation.

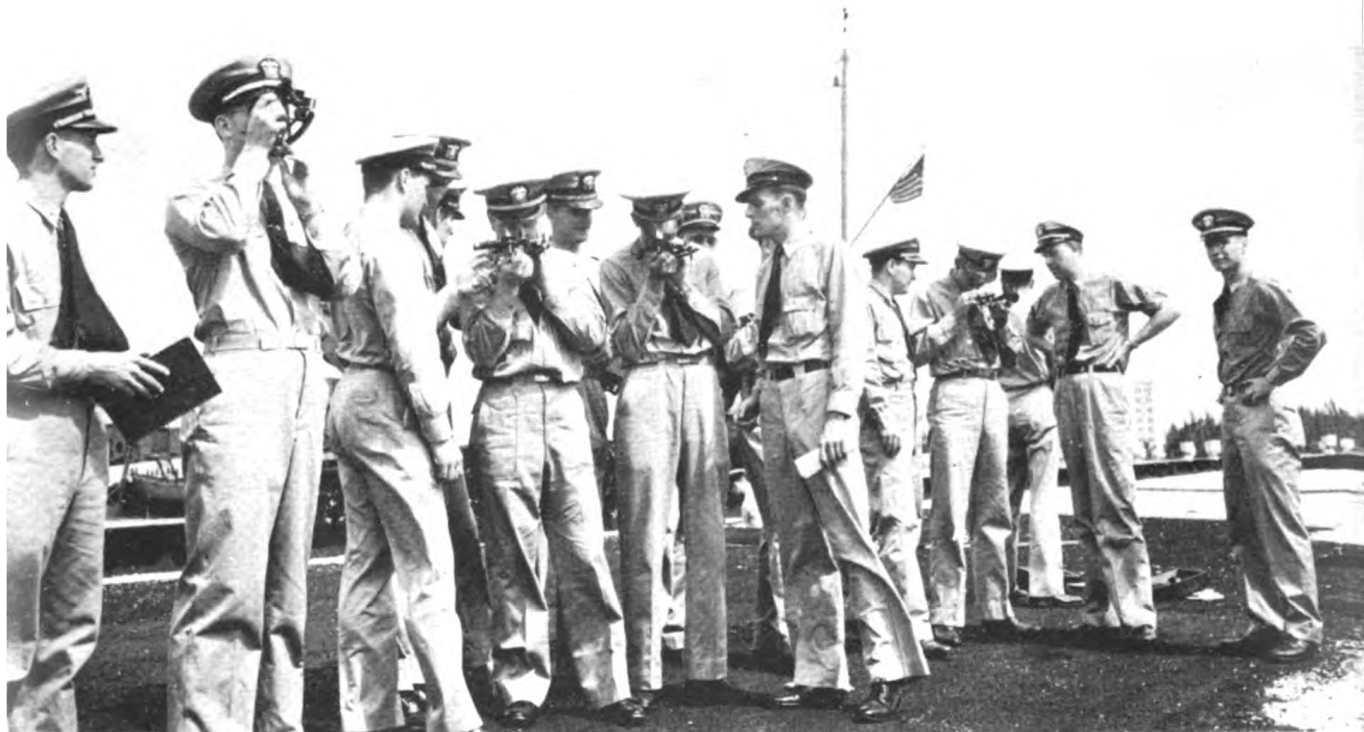
Within a week the men in Gunnery School have learned the first intricacies of the .30-caliber rifle, the .45-caliber Thompson gun, the .45-caliber pistol, the 20-millimeter and .50-caliber machine guns. Later, these men, who specialize in the actual shooting when the shooting starts, will find themselves able to take any of these weapons down and put them together blindfolded or in the dark. Many are the times when PT-men have thanked their lucky stars for the weeks of arduous early training in the mechanics of small arms and machine guns. Clogged or jammed guns have had to be cleared and repaired under the broiling tropical sun, in the black of the night, when the spray was freezing fast to everything aboard, and even when the hail of Jap bullets fell altogether too close for comfort. A gunner cannot know his weapons too well.

While the Gunner's Mates and Torpedomen receive a far more intensive course in all forms of armament than do the radiomen, the cooks, the engineers, or the seamen, all must know

their small arms and know them well. When a PT-boat gets into a fight, every man aboard, with the possible exception of the engineers, has a hand in it, and even the engineers have been known to pop up through their after hatch to sling a fistful of hand grenades. It becomes the specialized duty of the Gunner's Mates and the Torpedomen to know all there is to know about every firearm carried, including the intricate torpedoes, and the violently explosive depth charges, or "ashcans."

Before these men are through with their Course A, they will have learned how to take the "tin fish" apart and reconstruct them. The Torpedoman will have put in many long, hard hours in a factory that manufactures the cigar-shaped Jap and Nazi eliminators. A torpedo weighing more than a ton is 24 feet long, is made of steel, and carries a warhead of several hundred pounds of high explosives. The intricate mechanism consists of 3000 precision-built parts and costs about \$12,000. During the short period of a torpedo's life from the time it is fired until it scores either a hit or a miss, it travels through the water at 40 miles an hour. If the target is missed, the torpedo runs on, then automatically sinks.

Depth charges, being an important part of a PT's armament, are studied at length. The men learn that the usual size "ashcan" weighs 420 pounds by itself, and that the arbors, which contain the impulse charge that drives the depth charge from a K-gun or a Y-gun, weigh another 60 pounds. Use of ashcans from a PT-boat, however, usually means rolling them from a rack on the fantail, or stern, directly into the ocean when the PT is presumed to be directly over the submarine. The K- and Y-guns are found more often on other types of sub-busters. There are even larger depth charges, weighing 600 pounds, which are used to demolish the newer German subs, but these giant ashcans are nearly always carried aboard larger ships, such as corvettes, destroyers, and destroyer escorts.



Officers practice with the sextant, that indispensable aid to navigators. Navy jargon terms this: "Shooting the Sun."

A flotilla of speeding MTB's is an inspiring sight.



To men from the middle west and other interior sections of the United States, the corrosion which can be caused by the salt in the ocean is something new and quite a problem to conjure with. The smearing of all gun barrels, breech mechanisms, torpedoes, and all metal parts of armament and the ship itself with grease or cosmoline is at first a curiosity. The day will come when that chore will take on the aspect of drudgery, for the sea and its corroding influences are forever at war against man and his mechanical contrivances, and only the greatest of care will prevent fouling, pitting of gun barrels, and even actual interruption of service, perhaps in a moment of extreme danger.

While the gunners are mastering the science of firearms and explosives, the Machinist's Mates are getting ready to delve into the innards of gasoline engines, generators, batteries, motors, oil filters, transmissions, superchargers, and all the other complicated pieces of machinery that help to power a PT. One good look into the engine room of a mosquito boat is enough to give anyone but a steeped-in-the-grease mechanic a fine case of jitters. In the after part of the ship, and reached by a hatch which locks down flush with the deck, is a rectangular space just long enough to contain three enormous 1300-horsepower supercharged Packard engines of 12 cylinders each, together with all their accessory equipment. One engine is housed on either side of the tiny room, with the third set ahead and amidships, leaving a short and narrow aisle between the banked power plants.

Up on top of the starboard, or right-hand side engine, is a small box of a seat, cushioned with a simple leather pillow, and with no back rest or hand rails. There is no need of any such creature comforts, for when the ship is in motion, the engineer is about the busiest man aboard, and he is too preoccupied manipulating his levers and watching his gauges and dials to have need for them. When a PT is idle, the engineer quite

naturally climbs down from his perch. The engine room will reasonably accommodate two men at one time, and as each of the three giant motors has a shift lever, and as all signals are flashed from the bridge by means of electrically operated signals which show up in dials directly in front of the engineer on the perch, there is plenty to keep both men busy when the ship is performing any of the gyrations and antics of which she is capable.

After a series of lectures and blackboard talks, the Machinist's Mates will begin work in the shops, where every item of a PT power plant is on hand for experimental and study purposes. Motors will be torn down and reassembled, bearings will be re-bushed, carbon removed and valves ground. Generators will be pulled apart, as will also the superchargers, the gear casings, and every other component part of those huge motors. While the maintenance force, which likewise takes part in the portions of the training course applicable to its work, will be available for help in repairs and replacement of worn parts to a considerable extent, the records of mosquito boats thus far in the war show that breakdowns and accidents often occur far from the base. Many are the seemingly impossible tales told around Melville of the makeshift repairs and the improvised methods used to keep disabled PT's running long enough to get "home."

Motion picture lectures, slide-films, and greatly enlarged working drawings are used to impress on every man the necessity for seeing that all parts are frequently checked for wear, alignment, and other trouble causes. During the entire first month at Melville the Machinist's Mates spend most of their daylight hours up to their elbows in the innards of engines and the other mechanical devices that make up the power and lighting equipment of a PT. They'll probably see piston rings in their dreams, have nightmares about fouled spark plugs, and waken their shipmates

in the Quonset huts by muttering of clogged oil lines, leaky batteries, worn ignition points, and many other problems that have faced them in long days of toil.

But all tasks, however dolorous, have an ending, and eventually the day arrives when the men who make the PT's go, receive their reward. It comes in the form of a first thrilling trip around the bay, and a chance to handle and control the powerful engines which, from nightmares of grease and thousands of parts, will come to be their pride and joy. As each man sits for the first time on the top-o'-the-engine-perch, reaches out his feet to the stout footrests, and grasps a shift lever in either hand, he feels that this is one of the greatest moments of his life. As the signal from the bridge blinks for one motor ahead, he moves the first shift lever into place. After a brief warming-up period, the second motor goes into action, and later the third. With all motors purring sweetly, his eyes glued to the dials, and his hands on two of the levers, the budding engineer is almost in Machinist's Mate heaven. Only another few weeks until he and the rest of MTBRON 69 will graduate, and then he'll have his own ship—and his own engines.

MTBRON 69 STUDIES COMMUNICATIONS

EVERY MEMBER OF A PT-crew from the skipper to the cook must know how to signal with the semaphore, the blinker, and the telegraph key and be able to send and receive at the rate of twelve words a minute. However, any man admitted to the MTB Base at Melville will have been in the Navy long enough to have mastered the first principles of all three. Some will be quite expert, others will need further practice. Communications in all their forms have played a far greater role in this war than in any previous conflict.

With a squadron of fast-moving PT-boats and the lightning-fast tactics they employ, it is readily understandable that the Commanding Officer must keep in constant touch with all of his ships, and they with each other. Therefore, with communications being so important, every enlisted man and every officer of MTBRON 69 will spend many hours improving his ability with the semaphore flags, and in blinking or tapping out the Morse code. They will also study and memorize the varicolored International Code Flags and Pennants and the special United States Navy flags and pennants. In addition, one man out of each crew specializes in communications in all its branches.

Before they leave Melville, these specialized Radiomen, which is their technical naval rating, will have mastered the mysteries of various sound-detecting devices, as well as the principles of radio, electricity, and other forms of visual and audible signaling

and communications. It is their job not only to keep all mechanical forms of outside communication in operating order, and to be able to send and receive expertly, but also to maintain the efficiency of the ship's own signal systems from the bridge to the engine room and other parts of the craft.

The mastery of communications is a rather large order these days and includes a thorough knowledge of (1) "Visual Signaling," which is any method of above-water communication, the transmission of which is capable of being seen; (2) "Sound Signaling," which is any method of sending Morse signals (the dot and dash system used in telegraph work) by means of siren, whistle, foghorn, bell, or other sound apparatus. A "message" is understood to be any communication sent by land telegraph, sound signaling, visual signaling, radiotelegraphy, or radiotelephony.

All nations have their secret codes which become particularly important in wartime, but the symbols for the secret meanings are, for the most part, based on the flags used in visual signaling or the International Morse Code for sound signaling. Codes of signals for visual use by mariners have been published in various countries since the beginning of the nineteenth century. The first so-called International Code was drafted in 1855 and contained 70,000 signals. There have been several revisions, the last of which was in 1930, when it was agreed there would be seven editorial editions in English, French, German, Italian, Japanese, Spanish, and one Scandinavian language.

The International Code of Flags and Pennants is made up of 26 colored flags, one for each letter of the alphabet. There are also ten numeral pennants, three substitutes, and the answering pennant. Each of these flags is referred to by a name, and not by the letter or numeral alone. This is done to avoid the obvious confusion that might arise if the flags D T E were observed in a hoist and reported to the radioman or the officer in charge merely

as "D T E." The E sound is duplicated by several other letters of the alphabet, so the observer reads the flags by their names, "Dog, Tare, Easy," and thus eliminates possible confusion and misunderstanding.

While the flags and pennants of the International Code are identical with those used in the Navy as to shape and coloration, the calling names vary in several instances. The Navy flags are known as: Affirm, Baker, Cast, Dog, Easy, Fox, George, Hypo, Int (Interrogatory), Jig, King, Love, Mike, Negat (Negative), Option, Prep (Preparatory), Queen, Roger, Sail, Tare, Unit, Victor, William, Xray, Yoke, and Zed. In radio and other audible communication it is clear that misunderstandings would be inevitable if the letters of the alphabet were spoken as individual letters. For these forms of communication, therefore, this phonetic alphabet has been devised.

Radio remains a complicated study of wave bands, tubes, wires, antennas, resistors, condensers, and whatnots. All these and more must be familiar to the specialist signalman of a PT-crew, and the other members of the outfit will be required to have at least a basic understanding of radio.

There is one other device in the expansive category of communications, an honorable veteran of the last war, which, with considerable improvements and refinements, is again proving invaluable. That is the underwater sound-detecting instrument with which the hulls of all vessels, particularly submarines, are located. The basic principle of searching out subs with sound-detectors has not materially changed since the last war, but science and inventive ingenuity have streamlined the process and refined the apparatus. Formerly, if an enemy submarine remained quietly on the bottom of the sea to avoid detection, and if its commander was sufficiently unobliging to refuse to revolve the ship's propeller now and then, the business of "putting the finger" on a sub became more difficult and less

accurate in its results. In the present conflict, the principle of sound reflection under water, long applied by the larger merchant and war ships to maintain a continuous graphical record of the ocean's floor beneath the cruising ship, is being adapted to search out silent submersibles that endeavor to "play 'possum" far beneath the waves.

The exact extent to which echo-sounding devices are utilized, and their scientific and mechanical make-up, are among those things which cannot now be told. The principle of underwater sound-detecting involves the directional broadcasting of a "ping" through a sending apparatus at about one-second intervals. The "ping" travels through the water until it strikes an obstacle. Then the "ping" bounces back in the direction whence it came. The obstacle from which it bounced may be the bottom of the ocean, which would include valleys, rocks, ledges, or other obstructions, including submarines. It may be the hull of a neighboring ship, again including a submerged enemy vessel not actually on the bottom.

Mathematics enters the picture to compute the distance to the obstacle from the time required for the "ping's" round trip. The direction of the broadcasted "ping" and a compass provide the location. Besides absorbing the operating technique of the sound-detector, RON 69's communications experts will have to learn to distinguish between the various "pings," for there is a difference. But the "ping" that is most important is the one that comes home after finding a submerged submarine.

Despite the apparent emphasis placed on the so-called specialty ratings during the foregoing pages, no navy in the world can be maintained without its seamen. It would be comparable to attempting to run an army without privates. Both are indispensable in their respective branches of service, and each is a veritable jack-of-all-trades, and amazingly good in every one. The dictionary states that a seaman is "one whose occupation is to



Mosquito boats can turn on a dime.

assist in the management of ships at sea," and the world has few occupations that are older or more honorable. To call something "shipshape" is to label it with the skill of a good seaman. And so it is with PT-boats. The one man aboard who rates as a seaman is one of the most important men of the little crew.

Once more it must be emphasized that throughout the crews of mosquito craft, each man knows enough about the job of every other man to be able to fill his shoes in first-class style. Therefore, all enlisted men are, first, able seamen, and second, they are specialists as indicated by their ratings. For example, a man may be a seaman, 1st Class, and, having qualified for additional duty as gunner, he will wear on his sleeve the distinguishing mark of Seaman Gunner. As for the officers, the golden bars and stars of rank wouldn't be on their shoulders and cuffs unless they had been able to qualify in what might be termed the higher branches of seamanship and navigation. Despite this previous training, all officers receive additional instruction at Melville. MTBRON 69's ensigns and lieutenants will take Course A, which covers Rules of the Road, Boat Handling, Charts and Compasses, Piloting, Marlinspike Seamanship, and Celestial Navigation.

The B Course, through which all other members of the squadron will pass, covers the same subjects save for Celestial Navigation, but does so in a somewhat simplified and more basic manner. The enlisted men's B Course also includes study of Safety Precautions and Watches as well as Chart Corrections. Each of these subjects is a broad one and is thoroughly gone into from a theoretical standpoint during the first month at the Base, with the second four weeks devoted to practical application. The latter includes the practice cruises, toward which every man-jack impatiently counts the hours. The officers, as a group, will take two all-day cruises and two navigational cruises during which problems are propounded and worked out. Also as a group, and

to further their own practical education before they go out with the enlisted men, the ensigns and lieutenants will ship on a 30-hour cruise. Finally will come the practice trip to sea which each skipper and his executive officer take with their own men before finally being assigned to their individual PT-boats. Meanwhile, the enlisted men, under the critical eyes of instructors, will have had one all-day cruise and one 24-hour trip.

There is only one phase of their preparation for battle somewhere on the Seven Seas and their devilishly grim business of sub-busting that PT-men look forward to with greater anticipation than the practice cruises, and that is when, at length, they are qualified to step aboard their own "Dream Ship," but meanwhile they take a hitch in their belts, gripe over their excellent chow, and continue to "shoot the breeze 'round Melville."

SECONDS ARE EONS

IT'S A WEIRD SENSATION.

You, in the blackness, taut as a towing hawser, staring out over the end of the machine gun into the half light that is the horizon. You can hear that plane, but you can't spot it. Fingers have the frozen grip of death on the handle-bars of the gun. Seconds are eons—but there'll be so little time after you do see it.

"Watch him!" comes a calm voice from the darkness at your elbow. "He's coming out of the horizon—right at you!"

The hum of those motors—but there's nothing in sight—nothing! Why in hell doesn't he come out where he can be seen? Can't hit something you can't— Oh, oh! There! A speck just fell off the horizon—those motors!

"Brrrp—brrrrrrppppp—brrrp!"

"No! Not yet! Wait'll he's in range!"

You ease off the trigger—but you can't!— Fire!—Fire!— Do something, you fool!— He's coming in!— Those motors— You can't just stand—

"Now! Give it to him!"

"Brrrrrrrrpppppp—brrrp—brrrrrrrrppppp!"

"Lead him! More lead!" and the white pinpoints in the sky that are tracer bullets move up ahead of the plane.

Here he comes, straight on! Big as a barn—couldn't miss if you tried—and suddenly, there's no tenseness, no stage fright. It's fun! Whoopee!



Underway-clothing is warm and weather-proof.

"More lead! That's it. Watch him—he'll zoom up. Catch him in the belly!"

Yippee! It's like a wild Valkyrie song, those motors playing a thundering bass to the chattering obbligato of the machine gun. Now he zooms—boy, is he a target!

"Brrrrrrpppp—brrrppp—brrrrrrppp!"

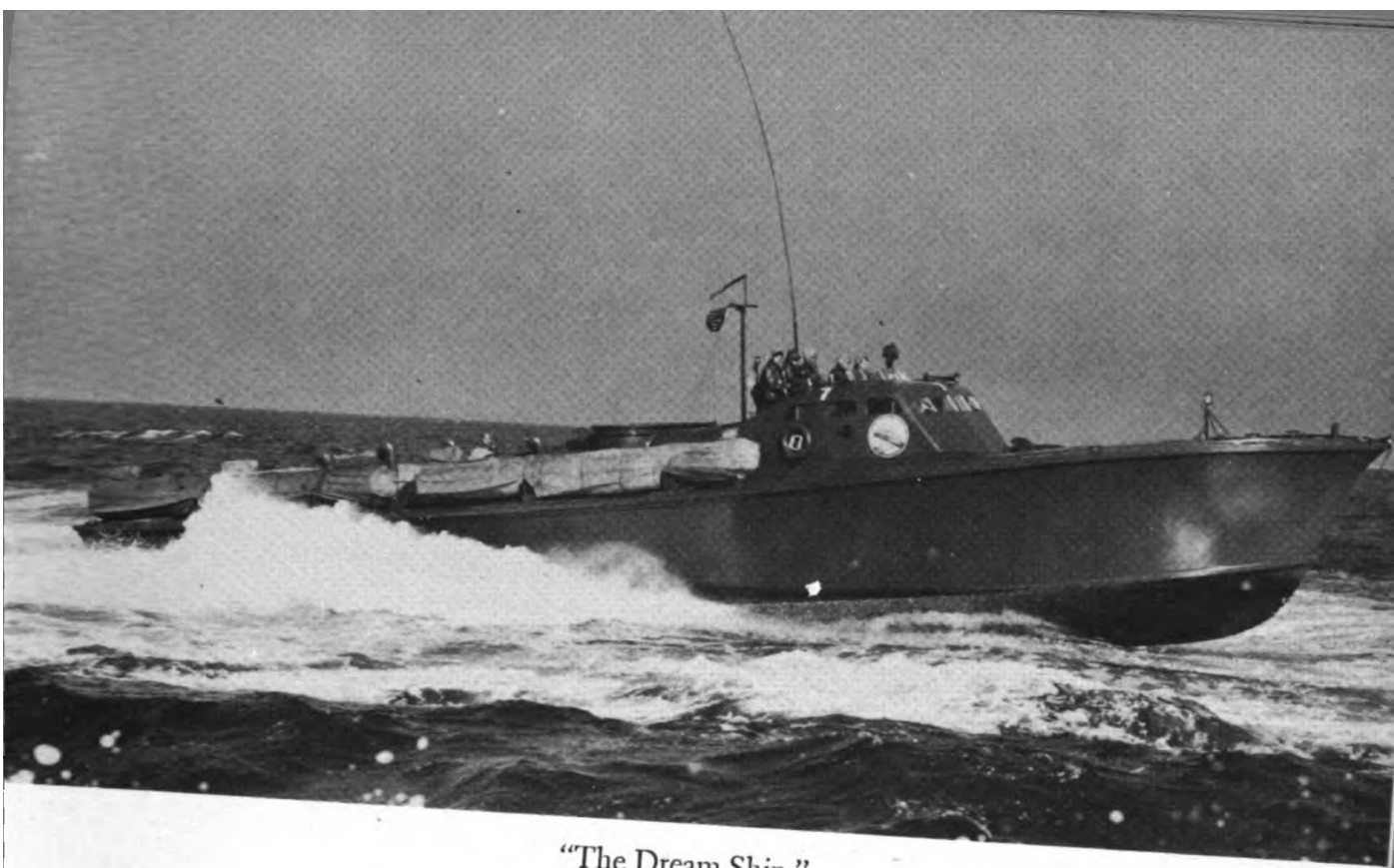
"Atta boy! Nice shooting!" compliments the calm voice at your elbow, and tracers spatter all over the bottom of the up-driving plane.

Whew! That was something! For a split second it seemed as though the plane would never veer off. Looked as if he would fly right into the muzzle of the machine gun. Never anything like it except in the movies.

And that is exactly what it is—movies, with full sound effects and a machine gun that chatters and vibrates like the real thing, but shoots only electric-eye "bullets." One of the latest practice gunnery innovations, the Machine Gun Trainer, is thus far in use at the Navy's firing range at Dam Neck, Virginia, and at the Motor Torpedo Boat Training Station at Melville, Rhode Island, to name two, with numerous other installations scheduled as soon as the complicated apparatus can be assembled.

With the aid of a 20-minute sound-effects motion picture of zooming, diving, strafing airplanes, the electric-eye principle applied to a specially built machine gun, and a pair of Polaroid glasses, the most realistic battle conditions are simulated, and hundreds of thousands of rounds of ammunition are conserved. So true to life are the bulletless battles between the gunner with his mock-up gun and the roaring planes on the screen that when men who have been through the real thing many times try it out, they confess to much the same sensations they experienced under enemy fire.

The building that houses the Trainer resembles a small, two-



"The Dream Ship."

Life jackets and oxygen masks are familiar to every sailor.



story auditorium. Covering the front end of the room is a large, concave motion picture screen, slanted forward at the ceiling. At the rear is the projection machine, and midway between is the machine gun, mounted exactly as if aboard ship. Next to the gun is a large, boxlike affair which records the number of rounds, or "bullets," fired and the number of "hits" scored.

After a gunnery class is seated in the back of the auditorium, the lights are extinguished and each man is given a pair of snug-fitting, Polaroid-lensed goggles, through which the zooming planes attain a third-dimensional effect, and appear to be live things, about to dive right off the screen into the audience. Pressure on the machine gun trigger releases a continuous series of electronic impulses, each comparable to the single trigger pull on the nickel-in-the-slot electric-eye guns found in amusement centers.

The screen is so constituted that each "bullet" registers a tiny, lingering white spot, and when the "bullets" strike one of the planes, hits are chalked up on the recording dial. The machine gun is mounted on a swivel so that the flight of the planes may be followed across, up, or down the screen, and its vibration and chatter are perfect imitations of the real thing. The run of film provides several trainees with short periods each, during which the roaring planes dive at the gunner from all angles.

Some shots are easier than others, but all provide practice in leading the target, the phase of shooting in which neophyte gunners are weakest. When a plane travels 400 miles an hour across the line of vision, and a thousand yards from the gun, the muzzle must be aimed far enough ahead of the target so the bullets will have time to travel that thousand yards before the plane has sped by. Lads who have shot skeet, or who have fired rifles at moving targets, understand the principle of leading, but even expert gunners never get enough practice.

Although the Machine Gun Trainers cost many thousands of

dollars, they soon pay for themselves several times over in the conservation of practice ammunition and in the resulting greater accuracy of American gunners.

However, shooting at fast-moving pictures of planes on the screen with the electric-eye machine gun is one thing, and keeping one's feet on the pitching, tossing deck of a PT-boat while firing bursts of machine gun bullets at an attacking enemy plane is something quite different. First of all, the gunner must be positive that the plane high in the sky, or barely visible through fog or clouds, is an enemy, and not from United States air forces or from those of our allies. This means that every member of MTBRON 69 must become an expert plane spotter, and, at the same time, he must learn to recognize the silhouettes of enemy and friendly naval ships.

There will be many hours of classroom work in this important subject for RON 69 before its officers and men are graduated, to say nothing of the additional hours spent in the huts memorizing the outlines of over a hundred ships and planes.

In the classroom used for recognition of planes and ships are two projection machines and a large screen. One of the projection machines resembles the many varieties used to throw the images printed on glass slides onto a screen. The image thus projected will remain on the screen until the operator pushes the slide carriage across its slot and replaces the picture with another.

The other projector is equipped with an automatic timing device which regulates a shutter over the projection lens, much like the shutter of a camera. As with the camera, the projection shutter may be set to remain open for varying fractions of a second up to one one-hundredth. Whatever the timing, the slide placed in the machine will be flashed on the screen only for that length of time.

The course begins with descriptive lectures on various ships and planes, with the "still" picture of each appearing perma-

nently on the screen while the instructor points out salient features. Three different units are stressed in each of the hours of class work, and as the men progress, they are repeatedly tested not only on the newest items, but also on those studied last week and the week before that. They are tested with the shutter set at different speeds.

The instructor places a slide in the automatic machine, sets the timer, and says: "Attention! Nowwww!"

The black silhouette of a plane flashes onto the screen for the very brief interval of a tenth of a second. The hands of nearly every man in the semi-darkened room are raised almost simultaneously to indicate recognition. Reaction is prompt, for the men have now had several hours of this work and the more common, more readily recognizable ships and planes have become easy. This one was a Flying Fortress.

To review and to further impress outstanding features of this great American plane, the instructor now places the slide in the other projector and throws a permanent picture of the "Fort" on the screen. He points out the contours of wing, fuselage, and tail, the location of the four motors, and contrasts them with those of the German Focke-Wulf "Condor," the British Short Sunderland, and other four-motored ships.

Now the timing device is set at one-twenty-fifth of a second, and the process is repeated, this time with a Grumman "Wildcat." Again, the hands of nearly every member of the class go up, but when the time of the flashing silhouette of a third and still different plane is reduced to one-fiftieth of a second, only about half the men recognize it as a German Heinkel.

Probably few people have ever realized just how extremely brief a period is one one-hundredth of a second, and yet now, more than ever before in warfare, catastrophes can and do happen in that seemingly infinitesimal length of time. Fast as RON 69's class in recognition has become by now, only about a quar-



PT sub-hunters receive supplies at sea from Navy auxiliary ships.

ter of the men raise their hands on the fourth silhouette, set for one one-hundredth of a second. The first two answers are incorrect, but the third man gets it right. It is a plane that all must learn to spot instantly, one they may see more of than they will like—it is a Japanese Zero.

Yes, speed, speed, and ever more speed is the watchword for the men, the ships, and the weapons in the PT-service. Even when patrolling waters in search of enemy submarines, a 12-ship squadron of mosquito boats can travel between 25 and 30 knots, an economical speed for them. Despite its lowness in the water, visibility from the bridge of a PT is approximately three miles in clear weather. Thus, a squadron, cruising abreast in line, with courses set so each ship is separated from the next by about six miles, will patrol some 2160 square miles of ocean in 60 minutes.

They are often called on to put forth extreme speed, reported to have been as high as 60 to 70 miles an hour, in order to arrive at a spot where a patrolling airplane has sighted a surfaced submarine. Once there, the depth charges are dumped. Again, speed plus maneuverability is the PT's best defense against attacking aircraft. When a target 80 feet long and 20 feet wide is zig-zagging at 50 miles an hour across the ocean below him, an enemy airman will have the greatest difficulty in holding his sights on it long enough to score a hit. It has been said that trying to hit a PT-boat with ordinary naval guns is like shooting at a gnat with an elephant rifle.

Former Secretary of the Navy, Charles Edison, who had much to do with the origin and development of the Motor Torpedo Boat scheme of warfare, said of them: "It is a deadly offensive weapon for use under the most trying conditions"—and its speed has a great deal to do with its deadliness. Speed in an attack on ships many times its size, such as destroyers, cruisers, and even battleships and aircraft carriers, is vital. One dark night during the Philippines operations, Commander Bulkeley sneaked care-

fully into Subic Bay and torpedoed a Japanese cruiser. Under a hail of shells and bullets, his speed got him safely away. Of that episode, William L. White, in his book, *They Were Expendable*, quoted the Commander as saying: "‘Anyway, the Tokyo radio reporting the attack next day said the Americans had a new secret weapon—a monster that roared, flapped its wings, and fired torpedoes in all directions. It was only us, but we felt flattered.’"

How a sub-busting ship looks from a blimp.



Chapter Six

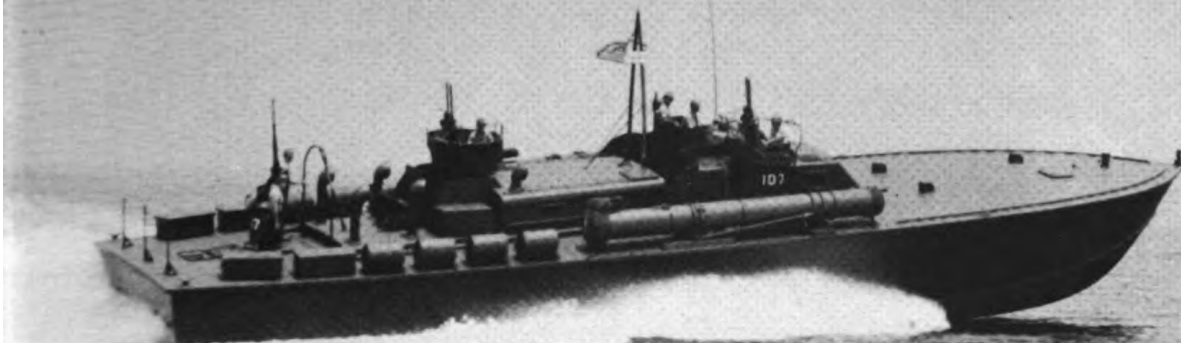
THE IMPOSSIBLE IS COMMONPLACE

ON THE BLACKBOARD OF
a classroom in a naval Training Station are the following words:

“The difficult things we will do at once,
The impossible things will take a few moments longer.”

No other seventeen words could better express the attitude of the men at Melville, and the longer they remain in PT-service, the more commonplace becomes the impossible. This calm and complete indifference to all obstacles is best exemplified by officers and men who have seen months of service on “the firing line” in their little “hellions of the sea.” It is a Navy policy to bring both enlisted men and officers back to the Station for rest periods. There they mingle with the lads in training, perhaps lend a hand in their education, but most of all they try to relax and smooth out jangled nerves. This business of performing the impossible takes its toll, a heavy one.

The men who came back from the Solomons tersely summed up their four months’ existence in that tropical war sector with the words: “It’s either high hell or extreme boredom.” They won’t talk much at first, those fellows who have been on patrol night after nerve-racking night. They have a faraway look in their eyes as though, through the Stygian blackness, they still were seeing ghostly shapes that could be anything from rocky islets to Jap destroyers and cruisers. There’s a hair-trigger action



With machine guns fore, aft, and amidships; with torpedoes and ashcans,
the Mosquitos tackle ships many times their size.

At full throttle, an MTB lifts her nose saucily and tears through the water.



Chapter Six

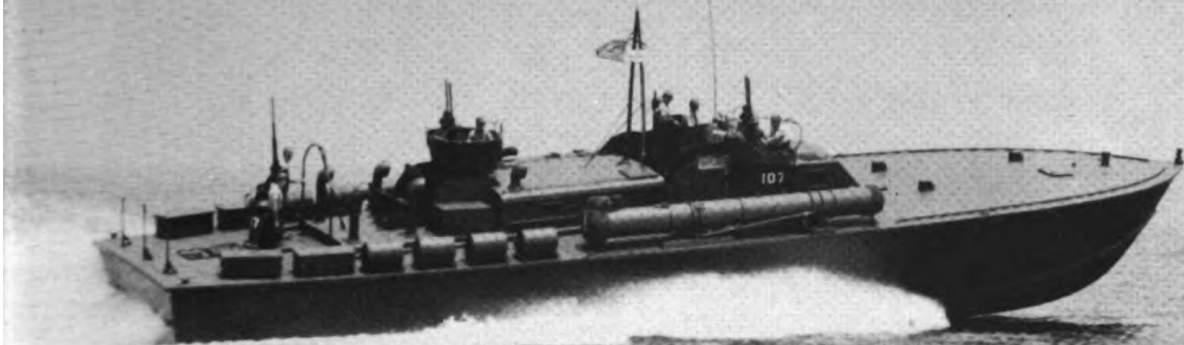
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The impossible things will take a few moments longer.”

No other seventeen words could better express the attitude of the men at Melville, and the longer they remain in PT-service, the more commonplace becomes the impossible. This calm and complete indifference to all obstacles is best exemplified by officers and men who have seen months of service on “the firing line” in their little “hellions of the sea.” It is a Navy policy to bring both enlisted men and officers back to the Station for rest periods. There they mingle with the lads in training, perhaps lend a hand in their education, but most of all they try to relax and smooth out jangled nerves. This business of performing the impossible takes its toll, a heavy one.

The men who came back from the Solomons tersely summed up their four months’ existence in that tropical war sector with the words: “It’s either high hell or extreme boredom.” They won’t talk much at first, those fellows who have been on patrol night after nerve-racking night. They have a faraway look in their eyes as though, through the Stygian blackness, they still were seeing ghostly shapes that could be anything from rocky islets to Jap destroyers and cruisers. There’s a hair-trigger action



With machine guns fore, aft, and amidships; with torpedoes and ashcans,
the Mosquitos tackle ships many times their size.

At full throttle, an MTB lifts her nose saucily and tears through the water.



to the turn of their heads, a nervousness as they smoke cigarettes, and a tight-lipped dislike of anyone who seems to have a desire to interview them or make them talk. They'll visit, later, with their buddies in the service, but there is a deep, strong antipathy toward people who appear to want to glamorize them, or make heroes of just ordinary guys, who merely did their duty.

The days were placid and hot in the Solomons, frightfully hot and unbearably placid—except at times. When those times came, placidity disappeared into the jungles or across the equator, and all hell popped from every direction. But when there wasn't any action, it was too hot to sleep, and, besides, the ships, the motors, and the guns needed attention. The steaming jungle produced moisture and clouds of insects. The first settled on men, guns, and motors, while the latter concentrated on the men. It meant constant, arduous, and sweaty work to keep weapons and mechanical apparatus in first-class operating condition. It meant working all day with little or no sleep, and patrolling the hazardous waters during the entire black of the night, never knowing, when you rounded a promontory, whether you would run smack into a Jap flotilla, or just scrape the PT's eggshell hull over an uncharted coral reef. But you could fight those things, for a while. You couldn't fight dysentery, jungle fever, and peritonitis, and all took their toll.

Despite all this, morale ranged high. The crews became used to their long night shifts, more or less lived on the excitement of anticipation, and soon reached the point where they could and did joke about it. They had ringside seats for some of the spectacular and violent fighting between the larger vessels of our Navy and those of Japan. At the beginning of the sea battle of November 12 to 15 the MTB Squadron was sent out to sneak through a screen of destroyers and cruisers and unload their torpedoes at the transports suspected to be hiding behind the hulls of the Jap warships. It seemed like certain suicide, and by

then all were tired and jumpy, with nerves frayed to a frazzle. But out they went, only to be ordered at the last minute to withdraw and keep out of the way of a large United States naval force which had come steaming down to find the Japs. What our ships did to Hirohito's navy is history; what those PT-men saw that November night when the two powerful naval forces blasted at each other with everything they had was awe-inspiring in the extreme.

But nervousness increased, the men lost from 10 to 30 pounds apiece, and from being 100 percent "on the ball" with high spirits and splendid co-ordination, they became jittery, sometimes quarreled among themselves, and even grew bitter because they hadn't sunk the entire Japanese navy. Up to then they had destroyed one cruiser, six destroyers, one patrol ship. Among the "probables" were another patrol ship and four or five other vessels, which, for tiny mosquito boats, could hardly be considered a poor bag in any man's war. But they were so keyed up, so taut from the tension of constant night patrols, the lack of sleep, and other causes that they felt they had failed miserably in their assignment. The Navy, however, didn't agree with them. All were highly praised and several won citations and decorations.

When relief came in the middle of February, the men let themselves go completely. They were men who had braved the hail of bullets from Jap machine guns, the screaming shells from their batteries in order successfully to send their torpedoes where they would do the most good. Now, tears streamed down their bronzed cheeks, they laughed and cheered and cried, all at once, and pounded each other on the back. They were going to get out of that tropical hell. They were going home, or some place where they could sleep, where they could cool off, where they could buy a glass of cold beer.

That's what service on the PT's means. As stated before, it is the toughest, hardest, most exacting sort of work, and only

men with enough of the right characteristics can take it on the chin and come back for more. That's what veterans from the Solomons did. They've gone back for more, and, with their experience and a good mental and physical rest, they have continued to give Hirohito's warriors far more than the little yellow men can stomach.

There is here no desire or intention to paint either a deplorable picture of the Motor Torpedo Boat service, or to glamorize. It is beyond a doubt one of the finest branches of the Navy, composed of the highest type of young men that America produces. Nevertheless, the demands of the service are heavy. Not the least of the problems is that of eleven men eating, sleeping, and living aboard a tiny craft 80 feet long and 20 feet wide. In confined quarters like that men must constantly rub elbows with each other and it's pretty easy to "get in a fellow's hair." There are no long or broad decks on which to expend pent-up energies and obtain some exercise. The superstructure of larger ships provides many quiet nooks and crannies where, during off-duty hours, men can relax with a book, write letters, or just loaf. There is no superstructure on a PT, and any nooks and crannies have been pre-empted by machine guns, torpedoes, ashcans, and sundry other items marked "Strictly business."

Despite the diminutive size of a PT-boat, the quarters below decks for officers and crew are surprisingly comfortable and, in fact, one can almost say spacious. Away up in the bow, or forepeak, is storage space for spare gear of all kinds and reserve supplies of food. Immediately aft, extending the full 20-foot width of the ship, is the fo'c'sle. Ranged on either side in double tiers are eight bunks, which fold up flush against the sides of the vessel when more room is desired. A table with two drop leaves is fastened securely to the floor, and this, with benches, makes for a comfortable and roomy crew's mess. Up against the partition between the forepeak and the fo'c'sle are built sizable lock-



The Destroyer Escort—Uncle Sam's newest sub-busting warship.

ers, one for each member of the crew. There are no portholes anywhere in the ship, but ventilating ducts and a small but efficient air-conditioning machine provide adequate fresh air.

A companionway runs aft from the fo'c'sle for about a quarter of the length of the ship and ends in a short flight of three steps that lead up to what is known as the Crew's Day Room. On the port side of this companionway, directly behind the fo'c'sle, is the crew's "head," which in the Navy signifies showers, washbowls, and toilets. Aft of that, in order, come the quarters for the executive officer and the skipper, each equipped with toilet and washing facilities, and each comparable in size and fittings to a medium-sized single stateroom on a passenger vessel. On the starboard side are the galley, a little room called the officers' mess, and the armory.

The galley is a model of modern conveniences and as a small kitchen would delight any housewife. There's no waste motion in this galley; everything is within Cookie's reach. Electric plates for cooking, generous electric refrigeration space, cupboards for the plastic dishes which won't break when high seas send them toppling to the floor, and supply shelves and cupboards complete the arrangements for satisfying the inner man. The cook has his job cut out for him in heavy weather, and there are times when preparing food and eating it each becomes a major problem. Sandwiches and coffee often provide the maximum portion of the fare so long as seas run high.

The officers' mess, with built-in benches and table, resembles a miniature breakfast room, but serves its purpose adequately. The armory is another smallish cubicle, but it can house plenty of ammunition, Tommy-guns, revolvers, and hand grenades. There are no spare torpedoes or ashcans aboard a PT. When the deck supply has been used up, the mosquito boat must return to its base or supply ship for replenishment.

The Crew's Day Room is a roomy lounging place extending

the full width of the vessel and is about ten feet long. It is built over the huge fuel tanks, hence the three little steps necessary to climb into it from the companionway. The day room is flanked on either side by long, comfortable seats, topped with leather cushions which invite a snooze during off hours. There is a table for writing or card playing, bookshelves for the library, and, all in all, it pretty well takes the place of those nooks and crannies to be found aboard the larger warships.

At the rear of the companionway, adjacent to the steps up into the crew's room, is a ladder which leads topside to the tiny, but completely equipped, navigator's office, and from there on up to the bridge. The navigator's room is so situated that, unless heavy weather demands all hatches be closed, the helmsman can stand at the wheel and be within easy voice distance of the navigation officer. It is here that all communication and sound-detection devices are located, and night and day the navigator's office is busily occupied.

The bridge of a PT-boat is an invitation to sun, wind, sea, and weather to step right up and blast the men on duty with all the forces at their command. Some of the older models of MTB's were built with a completely enclosed deckhouse, low and slanting, and generously set with windows for vision. Later designing has removed the roof and the sides, leaving only a slanting windshield to fend off wind and the spray, which, when traveling at high speed, can sting one's face with all the strength of tiny hailstones. It's strictly an open-air job, piloting a PT, and even with special water- and windproof clothing, it is no place for thin skins.

Everything aboard ship can be controlled from the bridge. Three hand-throttles govern the speeds of the triple-engined powerhouse in the stern. A series of push-buttons will selectively or simultaneously fire the two or four torpedoes, and other buttons send signals to the engine room, or ring alarms throughout

the ship for general quarters or other orders. Mounted on a staff on the port side of the bridge is a powerful light that can either throw strong beams into the night or be used as a blinker signal.

Behind the Crew's Day Room is the engine room, that astounding collection of modern mechanics which is so important to the tactics of a PT-boat, and which is normally the busiest section of the ship, when in action. It can be reached either through a small door in the rear partition of the crew's room, or through a hatch in the afterdeck. In the extreme stern, back of the engine room, is the lazarette, another storage space for spare parts, tools, and all the paraphernalia that a good Machinist's Mate can gather together by hook or by crook, just in case he might need it someday.

Thus it is apparent that while the mosquito boat is almost literally of pocket size when compared to other warships of the Navy, careful planning and expert designing have provided an amazing amount of space within the hull. As will have been seen from the description, access can be had to every compartment without going topside. Vessels that are subjected to such poundings as the MTB's receive in heavy weather must be strongly constructed, and at the same time they must retain lightness for buoyancy and maneuverability. Hull planking, which is double, is of African mahogany, with a total thickness of almost an inch, and is laid diagonally to impart greater strength. Specially prepared and doped fabric placed between the inner and outer mahogany sheathings assures watertightness, and so buoyant is the entire structure, that it would float with all watertight compartments flooded. As the PT draws only five feet of water, it can venture into small bayous or the mouths of streams far too shallow for larger vessels, hiding out, if necessary, from searching enemy aircraft.

When MTBRON 69 leaves Melville at the end of the training

period, the squadron will take its own ships along, but they will not necessarily be in the water. If a squadron is assigned to duty on the far side of the world, men, boats, base crew, supplies, and all are transported to somewhere near the destination aboard huge transport or freighter ships. In such instances, each MTB-boat will have its own cradle of heavy, protecting timbers, built especially for the purpose. The ship, which weighs about 50 tons, is placed in the cradle, carefully packed to prevent any damage. Then ship and cradle are hoisted by crane to the deck of a cargo vessel. On some of the trips to distant war sectors, the officers and crews have lived aboard their own little ships, perched 25 or 30 feet above the deck of the transport.

There have been a number of differing reports as to the speed and the cruising range of the MTB's. Possibly all are correct, for there have been several models produced by various manufacturers, including The Elco Naval Division of The Electric Boat Company, The Higgins Industries, The Huckins Yacht Corporation, and the Fisher Boat Works, Inc., as well as several of the Navy's shipyards. Although considerable information has been made available to the public, many of the construction and operation details have never been released. It is known that the hulls of the several models have varied from 54 feet to greater feet in lengths, with the 77-footers proving most popular.

These latter ships have triple screws powered by three 4M2500 twelve-cylinder Packard engines, each developing 1350 horsepower. They have been credited with speeds up to 70 knots, and readily maintain a 50-knot pace in rough water. Their cruising range is said to be 2000 miles at 9 knots on one of the engines. Figures on gasoline storage and consumption are restricted, but when all three engines are in use and a speed of 40 knots is held, the cruising range drops radically to about 645 miles. Only 100-octane gasoline is used and great is the care taken with this extremely volatile substance during refueling

operations. Only the one or two members of the crew directly concerned with filling the tanks are permitted anywhere near the vessel. All others are sent ashore, and every precaution is taken to neutralize the electrical apparatus and any other possible hazards aboard ship.

Needless to say, no details concerning the performance and care of their future "homes" are withheld from MTBRON 69. By the time they have finished their training and are pronounced fit to take over their own craft, their "Dream Ships," they will have mastered every intricacy of construction, every minute item involving maintenance and operation.

And the eight weeks at Melville do speed by, as only busy weeks can. Almost before they realize what has happened, the men are in the home stretch. They have been out on the practice cruises and feel very much at home on the heaving and diving deck in rough seas. They "shoot the breeze" knowingly during the last evenings in the Quonset huts about all they have absorbed, where they will be stationed, and what they will do to the Jap and Nazi submarines and other ships. Rumors are rife. One has it they will be sent to the South Seas, another puts them in the Mediterranean, and a third would send them north into the Aleutian waters. No one knows, and no one cares very much. The one fact among all the fancy is that they are ready to go and that they will go, soon.

Then, one evening, a report spreads through the Station like wildfire. "The 'Dream Ships' will be in tomorrow! We'll be shoving off!" There's not much sleep that night among the members of MTBRON 69, and every man-jack will be up long before reveille tomorrow. It's Christmas all over again. The row of finger piers in the Melville lagoon will serve as the Christmas tree, and the presents, one for every man in RON 69, will be the "Dream Ships."

Chapter Seven

“SHOVE OFF, RON 69!”

ALL GOOD AMERICAN sailors are proud men. They are proud of the Navy, proud of the uniform they wear, and if anybody thinks they aren't especially proud of their own ships, let him make some disparaging remark about those ships—and be prepared to take the consequences. In this respect RON 69 is no different from any other body of naval men, unless, perhaps, it is possible for men to have a sort of super-pride in the craft to which they are assigned. After all, the MTB's are one of the Navy's newest sub- and warship-busting weapons, their record thus far in the war is little short of miraculous, and a man is lucky to get a ship like this.

Let's go aboard a PT-boat with Ensign William Hall and his crew while they make their initial inspection and watch their reactions. Ensign Hall, the skipper, is young, bronzed, not overly tall, but well put together. This is his first ship, he's worked very hard to get it, and there's no denying that his heart pounds a little faster as he steps from the pier to the slanting gray deck, up onto the bridge—his bridge—and places his hands on the wheel. Bill Hall has a pair of brown eyes that look directly at you. They're serious eyes, quirked with an undeniable sense of humor at the corners, but above all they give you the impression that the man who owns them knows what he is doing every minute. Just now they have an extra sparkle from excitement and pride of ownership, but they still retain a solid, unswerving something.

Yes, we decide, Ensign Bill Hall will make a cracking good skipper. He'd be a good man to serve under.

The same thing goes for Ensign Thad Hatch, the Executive Officer, whose broad shoulders and lithe step mark him as the star halfback he was but a short while ago. He, too, wants to get the feel of the bridge, and after standing a moment looking out over the bow of his MTB into the blue waters of Narragansett Bay, he turns and silently holds out his hand for a congratulatory handshake with his commanding officer. They'll make a splendid team, these two.

The nine-man crew is aboard by now, poking their respective noses into all parts of the ship, particularly those sections which, in days to come, will most closely concern them. The engineers have descended the little ladder leading from the deck hatch to the engine room. Despite the many long hours they have spent with exactly the same type of motors, and notwithstanding their natural mechanical proclivities which have always made gas engines second nature to them and which have brought them to this kind of Navy job, they gaze in awe at the sleek, shiny monsters of the power plant—their power plant. But with mechanics' inherent desire to get their hands on gadgets of all kinds, they are soon clambering all over the place, checking this and that, commenting on construction, location of dials and gauges, and, in no time at all, acting very much at home.

The cook is down in the galley, gleefully having the time of his life with the shining, gleaming implements of his trade. The radioman has twirled his dials and found a popular band which, possibly prophetically, blares forth with "Moonlight Becomes You." The seaman and one of the Gunner's Mates have found the Crew's Day Room, the other gunner is up in the fo'c'sle, figuring out which of the folding bunks will be his. There is no armament on the ship at present. That will come later, but the torpedoman seems enthralled with the mounts for his torpedo



The Miami, Florida, school, where DE-men and other sub-busters are trained.

tubes, and altogether, Ensign Bill Hall, his "Exec," and the entire crew are like a troop of youngsters with a new toy. It's the same with the rest of RON 69. They just have to get this exuberance out of their system, and each does it in his own characteristic way.

Things move fast during the next few days. Life at Melville for MTBRON 69 is nearly over. It's been hard going, with plenty of weary minds and tired muscles, with many new acquaintances, and memories galore to take along to the far corners of the world. The ships are gassed-up and practice runs are made out over the bay to break in the engines and to get to know the individual craft as well as possible before the final shove-off.

If Ensigns Bill Hall and Thad Hatch and their crew were thrilled just to be aboard the new PT-boat, you can imagine what their sensations must be when they first take her out for a trial run. Your pulse would beat pretty fast, too, if, after casting off your own "Dream Ship" from the pier, you squatted down alongside the bridge, and hung on to the grabrail. On one engine she moves slowly out of the lagoon. Then, with all the bay before you, the skipper gives her a little more throttle, at the same time warming up the other two engines.

Just coasting along now at nine or ten knots, the mosquito boat isn't much different from other motorboats you've been on. But she can travel, as you soon find out. The skipper signals for the second motor to come in, and then the third—now you've got something! The dull roar of the motors sends pulsations of power throbbing through the light frame of the ship and into your system. The bow begins to lift saucily out of the water with the increased speed. Faster, faster, and still faster until the wind whips you and the salt spray flying over the bow stings your face with a delicious tingling sensation. You glance up at the skipper with a questioning look and his lips frame the phrase

“43 knots,” but you can’t hear a word for the noise of the motors and the wind whistling past your ears. That’s as fast as you’ll go on this trip, for the motors are new and stiff, but if it’s like this at 43 knots, what must it be at 60 to 70?

Wondering how things are going down in the engine room, you make your way carefully aft. There are no handrails along the sides of PT’s. A single misstep would catapult you into the foaming wake. The engine room hatch is open, so you stick your head down in, then descend the ladder. The roar is simply terrific, and Tommy, one of the engineers, hands you some wisps of cotton to stuff in your ears. Some of the boys use the regular rubber ear plugs issued for this purpose, others improvise plugs from the rubbered ends of lead pencils. Mac, one of the other engineers, sits up on his little perch above the starboard engine, his hands resting on two of the three shift levers, his eyes glued on the dials and gauges, and a flashing white grin lighting up his face from ear to ear. He’s in a special heaven, just for engineers.

Next, you crawl through the little door into the Crew’s Day Room and make your way forward past the officers’ quarters on the port side, and the galley to starboard, to the fo’c’sle. There’s a choppy sea running and as the PT slices through the water, the waves sound a constant drumming against the bow, now fairly high out of the water. It is easy to realize that at full speed in rough weather the ceaseless pounding could make sleep well nigh impossible. The trip made by Commander Bulkeley’s PT’s when they evacuated General MacArthur and his staff from the Philippines comes to mind, and you wonder again how in the name of Heaven they ever got through.

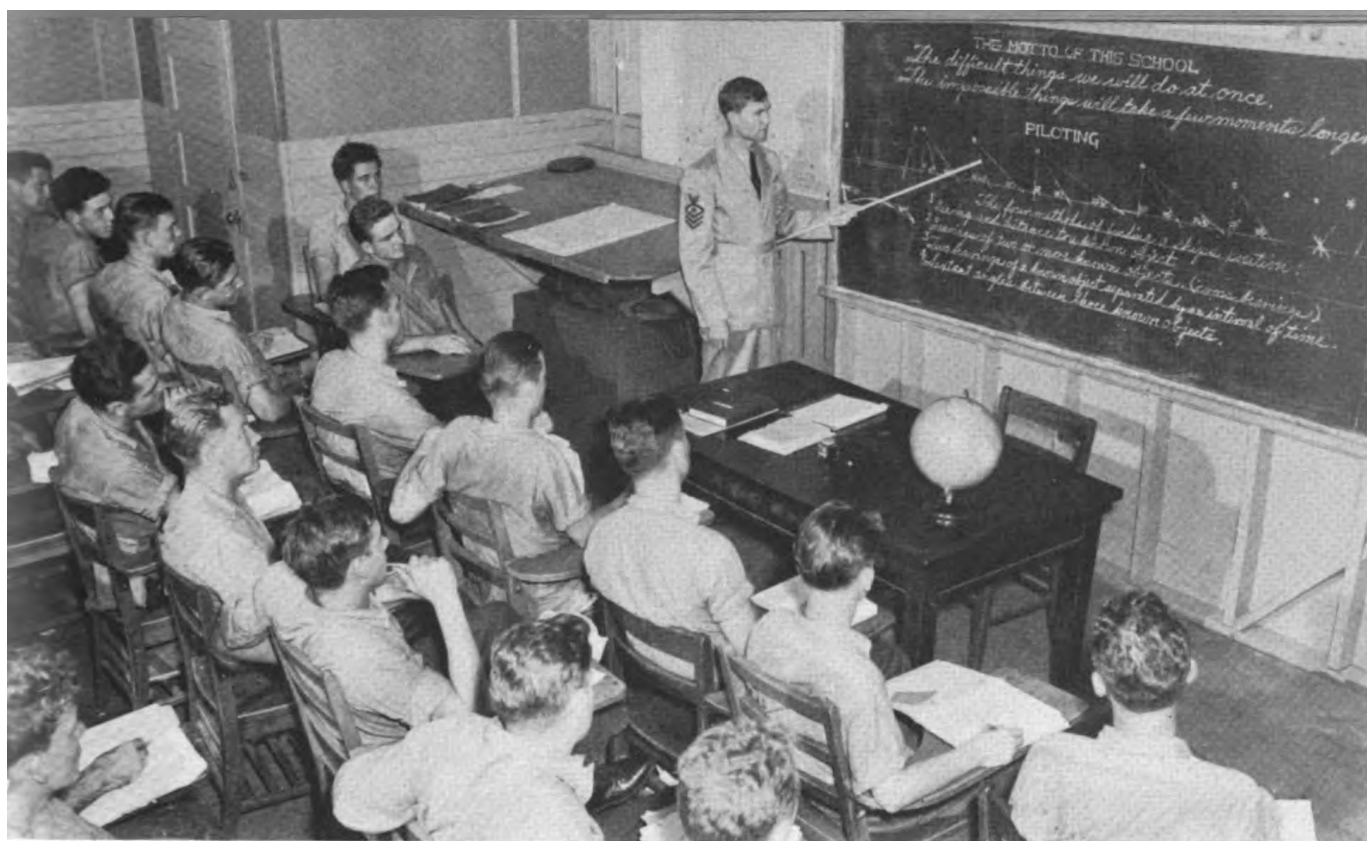
But the excitement of this moment is topsides, so up the ladder you go, past the navigator’s little cubbyhole of an office, and out onto the bridge. With the speeding ship running quartering against the wind and waves, the spray comes over the

bow in sheets. It whips up over the windshield in front of the bridge, so the skipper and the "Exec" have donned their tight-fitting helmets, their goggles, and their "underway clothing." The trousers and jackets of special weather-proof jungle cloth shed the water like a duck's back, and navigation is much more comfortable.

The skipper points to an old hulk, lying on its side in near the shore, and shouting through the wind and spray into the "Exec's" ear, he suggests, "Let's pretend that's our target." He puts the wheel over and the PT-boat swings gracefully to starboard, her deck slanting, motors roaring, and spray flying off in an arc on the port side. With his course set to come in on the hulk at an angle, Ensign Hall reduces speed and signals the engine room to muffle the engines, and suddenly you can hardly hear them. No wonder PT-boats have been able to sneak up on the enemy in the dark!

Closer and closer you come to the target. The bow is pointing at the hulk slightly aft of amidships, and if you had torpedoes aboard, and if this was night and the real thing, and if the hulk was a Jap cruiser, every man would be tensely awaiting the moment to strike. Closer and still closer with the muffled engines. Every man at his post—stand by!—ready!—"Fire one! Fire two!" shouts the skipper with a grin, as he pushes the buttons on his control board in imitation of releasing the two torpedoes.

With the imaginary torpedoes speeding toward the imaginary enemy, Ensign Hall throws the wheel hard over this time and the little ship heels as she obeys the rudder and makes an amazingly sharp turn to port. Again the skipper signals the engine room, this time to cut open the mufflers, and at the same time he shoves the throttles of all three engines far forward. The PT seems almost to leap out of the water as she races away from the "enemy." "It's a hit, Bill! It's a hit!" yells the "Exec,"



"The difficult things we will do at once;
 The impossible things will take a few moments longer."

"A 20-mill" crew learns gun operation by sighting on a model plane.



as he cups both hands to resemble field glasses, and everybody grins and laughs at the "successful attack."

Some months from now, when RON 69 is engaged in the grim business of a real attack on enemy surface warships, or in stalking a submarine, the laughter, if it's there at all, will be different. There'll be a nervousness and a tenseness about it, even in the event of a hit, that will be a far cry from the care-free spontaneity of mirth out in Narragansett Bay.

There are more practice cruises, there's much tinkering with the motors, and many plans for last-minute leaves to visit relatives and friends. Old Man Rumor makes the rounds faster than ever as the Squadron's last days at Melville draw to a close. Within a brief 24 hours RON 69 is reported to be leaving for anywhere from the Canal Zone to Casablanca, from the North Sea to the South Seas, but it really doesn't matter. What counts is that they are going. Then comes a kind of farewell dinner, at which Lieutenant Harry S. Parker, an "old grad" of the MTB Training Center and lately returned from months of action in the Pacific, tells the boys a little of what it is like to see action aboard a PT-boat.

The Training Center's own little mimeographed weekly newspaper, *The Skeeter*, reported on Lieutenant Parker's remarks as follows:

"Speaking at a 'Y' Forum Supper, Lieutenant Harry S. Parker started out in a modest, informal tone as if he were chatting with his fellow shipmates. But the power and the grandeur and eloquence of the man mounted as he waxed warm to his subject. He spoke of PT's in general, of Japs in particular, of his experiences at Pearl Harbor and Midway. He said that those harboring an illusion that Japs can't fly and can't shoot and are afraid to die are sadly mistaken.

"He took a lot of the glamor out of the PT's, but he added a lot of hard, common sense. He spoke of being ready and

waiting around perhaps ninety percent of the time (He said this was the hardest part of the war), and then, poof!—all of a sudden you were in action. Lieutenant Parker stressed that by what you had learned while you were standing around waiting—by that you would now stand or fall. He said it’s much like a football club that trains all year for one game. Then, in a short while, it’s all over.

“‘Only this,’ concluded Lieutenant Parker, ‘this is a terribly more important game.’”

Next morning, MTBRON 69 shoves off. Twelve brand-new PT-boats warm up their 36 motors at the finger piers with a combined roar that echoes along the shores of Narragansett Bay. The squadron commander’s ship casts off, moves lithely out of the lagoon, and is followed by eleven other low, gray craft. Once in the open waters of the bay, they swing into echelon formation of four divisions of three ships each. It’s an inspiring sight, twelve speedy mosquito boats knifing through the white-capped waters on their way through the Narrows, to the broad Atlantic, then to a Navy outfitting base, then to—who knows?

Whatever their destination, they will search out and find the lurking Nazi submarine, the haughty Nipponese destroyers, cruisers, and other warships. When they have found them, they will treat with them as only PT-men and PT-boats can, as they have done since the war began, and as they will do until it is over.

(Author’s note: Motor Torpedo Boat Squadron 69, as depicted in the foregoing pages, is entirely a fictitious unit, even to the number “69,” and any resemblance to real persons in delineation of the various characters is purely coincidental.)

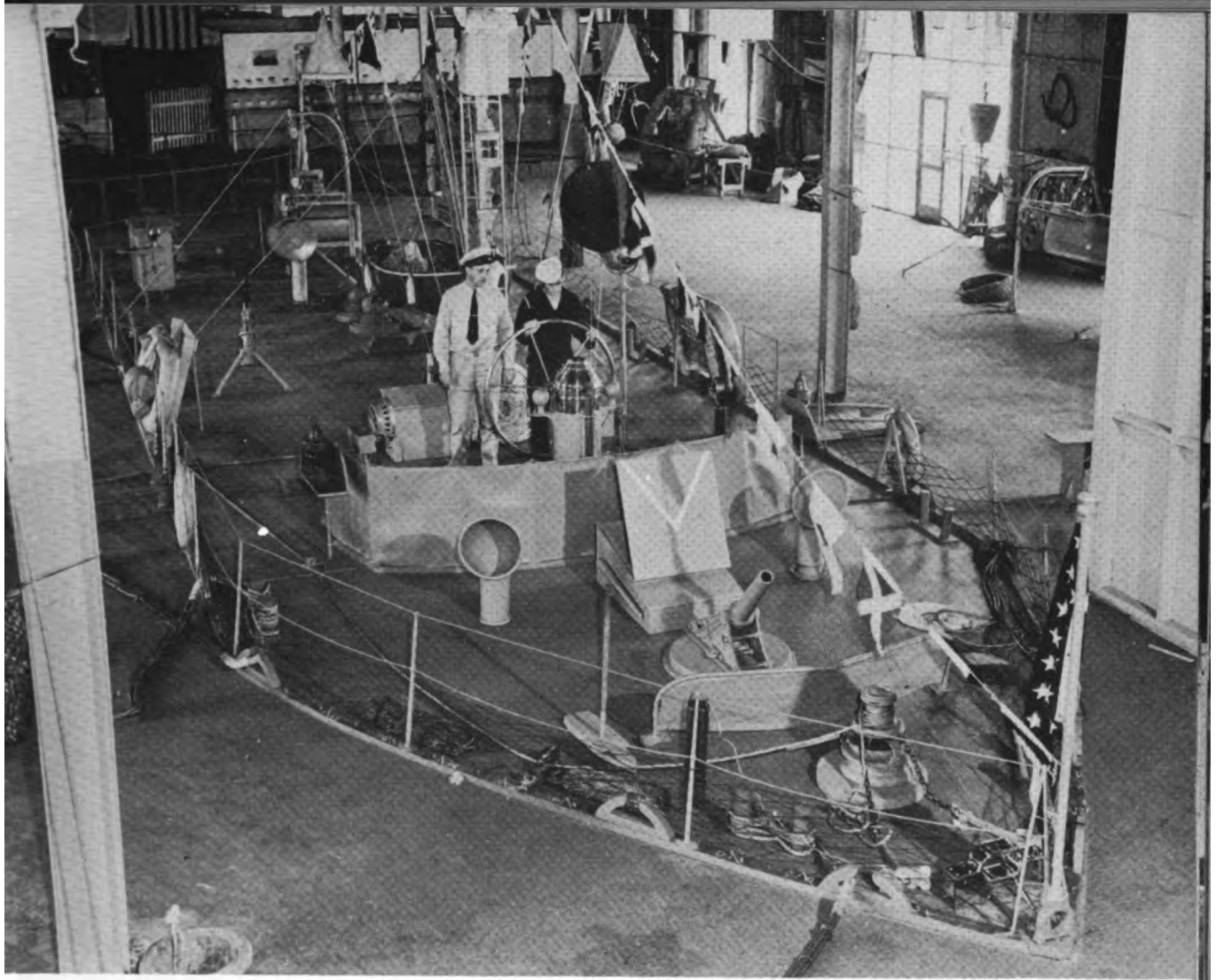
Chapter Eight

THE DESTROYER ESCORT PROGRAM

THERE'S NO SUCH THING as a good ship or a bad ship—good ships come from good crews.”

Although that is not the official motto of the Navy schools engaged in training seamen and officers to man the new Destroyer Escorts and other sub-chasing ships, it clearly and concisely sums up the attitude of the naval instructors who are making the world's most proficient “sub-busters” out of American boys. To an even greater degree, that theme rules the lives of the lads themselves, and serves to bind them even closer together. The wholehearted adoption of this principle by both instructors and students assures the United States that every new Destroyer Escort that is launched must be a “good ship.” It can't be anything else.

And new DE's, as the latest type of sub-hunting warships are called, are going to sea, with their highly trained crews, at the rate of more than one a week. The immensity of this plan, known as “The DE Program,” emphasizes, as has nothing else, the extreme seriousness of the past, present, and possible future menace of the enemy submarines. While reports of U-boat sinkings in the spring of 1943 were increasingly encouraging, the very fact that the Secretary of the Navy, in the first official statement about the new ships, said “several score are in the water” and “several hundred” more are called for in the con-



"Oscar," the mascot in the Crow's Nest, stands perpetual watch over this mock-up training ship.

struction program, clearly indicated the seriousness of the German efforts to cut our Atlantic supply lines.

The DE Program involves the announced construction of several hundred Destroyer Escorts. To man that many ships means the careful and thorough training of thousands of men and officers. Successful consummation of the plan promises the ultimate and total destruction of the German submarine fleet of from 400 to 500 U-boats, and the eventual elimination of Nippon's smaller fleet of some 80-odd submersibles. The DE Program proposes the re-establishing of one of America's foremost principles, one for which American naval men have fought and died since the days of John Paul Jones—the freedom of the seas. In short, it stands for victory in this most ghastly and greatest of all wars. Of such vitally important threads are the woof and warp of this sub-busting campaign composed.

A specialist ship like the Destroyer Escort, designed and built for particular tactics, must be manned by specialists. Hunting submarines is no child's play. It is mighty grim business, and the wolf-pack practices of the Nazis are cunning, sharp, and cruel. With a complement of from 176 to 190 technically trained officers and men to each DE, and all needed as rapidly as possible, the Navy was faced with a training problem that taxed its ingenuity and resourcefulness. To meet the situation, the Submarine Chaser Training Center was established at Miami, Florida, in May, 1942. It soon occupied nine hotels, many special buildings for class and laboratory work, and now boasts of several thousand students. More recently, many of the facilities of the extensive Naval Training Station at Norfolk, Virginia, have been turned over to the particularized education of future DE-men.

In both institutions the curriculum is varied, difficult, and condensed, requiring ten hours a day, seven days a week for periods of from one to three months, depending on the subject

matter to be covered. The enlisted men are offered courses in engineering, electricity, communications, yeoman training, gunnery, and seamanship. To accomplish this in so short a time, all available indoctrinational and instructional motion picture films, slide-films, and other educational aids are utilized. Instead of concentrating on training men for specific ratings, and officers for specialized billets, the two schools aim principally at one thing—to find the submarine and sink it. In this endeavor, the schools cut across many planes and segments of naval experience. They avoid specialization, and, in a mere thirty to sixty days teach their trainees to become everything.

By utilizing nearly all the Navy shipyards and a dozen or more privately owned ship-building plants on the Atlantic, Pacific, and Gulf coasts, and on the Great Lakes, a tremendous construction schedule has been achieved and is being maintained. Application of assembly line methods and invocation of all the arts and sciences of mass production have brought present construction time for a DE down to about four months, and the Navy hopes to better this in the near future. The ships cost, roughly, \$3,500,000. By comparison, it requires about nine months to build a destroyer, and about twice as much money.

The construction and personnel-training portions of the DE Program have been clocked to coincide as closely as possible. As fast as a DE is ready for sea, a full crew of officers and men are prepared to take over. This is accomplished by drawing on the Miami school for officers and key men who have had Navy experience and advanced schooling, and by training seamen, gunners, signalmen, machinists, radiomen, shipfitters, and other personnel at Norfolk. The crew complement of a DE is somewhat smaller than that of a destroyer, including five to seven specialists, four to five commissary men, five to six messmen, and among the seamen will be many schooled in specific arts, such as signaling, gunnery, mechanics, and so on.

The skipper of a Destroyer Escort is a Lieutenant Commander or a Lieutenant, and the rest of the command are junior officers of the rank of lieutenant and below. While the two sections of the crew are being trained at Miami and at Norfolk, the skipper, some of his command, and various rated seamen report to the shipyard to take over and help fit out their ship. They stay aboard during this process and await the arrival of the Executive Officer and the rest of the crew for their practice or shake-down cruise. After a week or ten days of intensive training at sea there is a final check-up of all weapons, mechanical devices, and parts, and with supplies of ammunition and food aboard, a new DE shoves off for her first submarine hunt.

Such is the amazing general, over-all picture of this stupendous DE program. The details of the panorama are even more engrossing. Thousands of men, heretofore ignorant of these things, must master the many arts of seamanship, the intricacies of several types of depth charges, the firing, operation, and care of 20- and 40-millimeter machine guns, the "Chicago Piano," the three-inch-.50-caliber dual-purpose cannon. They must assume the severe responsibilities of a lookout aboard ship, and in doing so they will learn to utilize parts of their eyes and portions of their optical nerves which largely have been neglected and unused since the days of caveman ancestors. They must be able to identify friendly and enemy aircraft and vessels. There is the ever-present danger of fire aboard ship, and to be prepared for this calls for a knowledge of fire-fighting equipment, a recognition of the terrible holocaust that can be caused by flaming oil and gasoline, and close acquaintance with oxygen helmets and resuscitative apparatus. All these things and many more are on the "must list" in the schooling of DE-men now in training at Miami and at Norfolk.

It readily will be apparent that not every man "has what it takes" to become a first-class sub-buster. There must be intelli-



In the dark, and in all kinds of weather, men must know how to take down and assemble guns.

gence, diligence, and a willingness to co-operate. A man must know how to be a member of the team. There has to be initiative, self-reliance, a sense of proportion, and, above all and foremost, the good, old-fashioned, American quality of "guts."

The enlisted men who enter the schools are required to have had at least the work of "Boot Camp," and preferably additional training at one of the many Navy schools, or else some active service with the fleet. The officer students, in the main, come from indoctrination schools, which are but one step removed from civilian life, and relatively few have had previous naval experience. In fact, many of them never studied any college mathematics, high school trigonometry, or any other subject even remotely concerned with the duties of a naval officer. Amazingly, by far the majority of them come through the strenuous course with flying colors.

Where are such men to be found? They come from all over the nation, from Michigan and Montana, from Oregon and Oklahoma, from Connecticut and California. They are farm boys and soda-jerkers; they are high school and college lads; they delivered telegrams and operated elevators. In brief, they are a typical cross section of young American manhood from Main Street to metropolitan centers, and the saga of their intensive training and subsequent service as sub-busters will become one of the strong overtones in America's song of victory.



"Practicing the scale" on the "Chicago Piano," the 1.1-inch rapid-firing gun.

CREW 21 MEETS N.O.B.

THE LONG, ONE-STORY, barracks-like structure known as Building 15 is but one of many similar buildings in the vast expanse of the Naval Operations Base at Norfolk, Virginia. It is partitioned into two large rooms, each of which contains twenty double-decked iron bed frames, ranged ten on a side. Save for a couple of wooden benches, there is nothing else in the rooms. Even the bed frames are empty. They are devoid of springs and mattresses, and the whole aspect is one of clean but utter barrenness.

Such was the status of Building 15 in mid-afternoon one Sunday early in May. Two hours later it was the scene of hectic confusion and a maelstrom of unmitigated chaos. Eighty young American sailors, weighted down with bulging seabags and securely lashed hammock rolls, had poured in through the four doors of Building 15 and taken over. Within sixty minutes after their arrival, however, serenity had returned and the barrenness had vanished. Sailors quickly learn to make themselves at home, and these eighty youngsters had been in the Navy long enough to know how to make their canvas hammocks serve as springs and mattresses by lacing them tightly to the iron bed frames. They then folded their blankets neatly on the canvas, suspended their seabags by ropes from the heads of the beds, and made everything shipshape and ready for inspection.

The following morning, Monday, at 0530, which is 5:30 A.M. to civilians, these lads would start a new chapter in their naval

life. They would be known as Crew 21 for identification purposes at the Base, and would enter one of the most intensive training courses they could ever have imagined. They were going to learn to be sub-busters. A brief four weeks later they would once more pack their bulky seabags, lash up their hammock rolls, and shove off, this time to board a Destroyer Escort and begin their wartime occupation of submarine hunting throughout the Seven Seas.

Number One problem immediately after arrival, however, was "chow," and Crew 21 learned that their mess hall was outside the wire fence enclosure, at the gate of which stood The Glass House, a structure of many windows occupied by the Officer of the Day and his assistants. Within the fenced-in area were several other barracks, all like Building 15, and each teeming with Navy men, other crews, also in training for service aboard DE-boats. Some crews had been there nearly four weeks, others three, two, or one. Every Monday morning at Naval Operations Base—N.O.B. to the initiated—one DE-crew leaves the school and a new one begins the strenuous curriculum. Within the area which will be 21's home for a month, are various facilities for recreation and the Navy's ever-present setting-up exercises. Across the street is one of the recreation halls at N.O.B. where candy, gum, cigarettes, soft drinks, and other small purchases may be made, and where movies are shown regularly. The city of Norfolk is nine miles away, at the end of a long bus or street-car trip, but if a man is adept at "thumbing," he may be able to signal a ride in a truck or private car.

Among the older of the Navy's training stations, N.O.B. today is an extensive place, covering several thousand acres, but even so it is far from the largest in attending personnel, normally caring for about 10,000 men. There is a huge airfield from which many types of aircraft are constantly taking off for training flights. The parade ground occupies a vast expanse across the

street from the row of red brick administration buildings. Since the war began, numerous wooden barracks, and huge buildings, somewhat resembling airplane hangars and used for classrooms and laboratories, have been added. Situated on the eastern shore of that famous harbor known as Hampton Roads, which is the expansive mouth of the James River, the Base is opposite Old Point Comfort, Fortress Monroe, and Newport News. N.O.B. has its own piers and wharves where warships of many types tie up, and its own lagoon where practice may be had with pulling boats and motor craft.

Earlier in the war it was one of the training stations for the Navy's Construction Battalions, the Seabees, of whom so much has been heard as the men who, on far-away islands and coasts, fight with one hand while they construct operations bases for the Army and Navy with the other. Not far away and on the Atlantic coast, at a place called Dam Neck, is the firing range where thousands of practice rounds of ammunition varying from the 20-millimeter machine gun bullets to the six-inch shells are fired by men training in gunnery. All in all, N.O.B., with its dozens of mess halls, its scores and scores of barrack buildings, its laboratories, classrooms, administration and recreation buildings, the baseball diamond, golf course and other playing fields, the aviation facilities, the docks, and the constant ebb and flow of uniformed men is a very busy institution. Crew 21 will put in an extremely industrious four weeks learning to be sub-busters.

And Monday morning, promptly at 0530, they start the new chapter with reveille. For the next 30 days their schedule of life, save for Sundays and specially arranged classes and events, will be about as follows:

0530—Reveille.

0545—Watch standers to No. 1 gate for early mess. Field day by all hands, inside and outside. Each crew details two



The 3-inch gun is speedy and accurate. A Marine gun crew scored 8 hits with 8 shells in 13 seconds.

men for head detail. Dump all G. I. cans. Make all bunks up neatly as instructed by Chief Master-at-Arms. NO SMOKING in buildings at any time. NO ONE permitted to lie in bunks during working hours.

0630—All hands fall in (2 ranks) at No. 1 gate for mess formation.

0730—Liberty expires. Muster at barracks by barracks officer. Hand in watch list for the day to Glass House. All school details shove off. (The next three hours are devoted to classroom and laboratory work.)

1030—Watch standers to No. 1 gate for early mess.

1130—All hands fall in (2 ranks) at No. 1 gate for regular mess formation.

1230—Muster at barracks by barracks officer. School details shove off. (Again comes a period of three hours of class and laboratory work.)

1530—Watch standers to No. 1 gate for early mess.

1615—All hands shift to uniform of the day and remain in uniform until lights out.

1630—Liberty begins. All hands must check out and in at the Glass House for off-the-base liberty. Fall in at No. 1 gate for regular mess formation.

1730—Athletic parties. Athletic instructors will be with each unit to arrange various events.

2100—Lights out.

Telescoped into those daily three-hour periods and augmented by some night classes will come concentrated doses of education in seamanship, swimming, gunnery, fire and damage control, instruction as lookouts, and air- and sea-craft identification. As each of those categories is here used in the broad sense, a breakdown of any one of them would be enough to keep an ordinary person busy for the four weeks, but sub-busters simply cannot be ordinary people and still be sub-busters. During their brief



This 40-millimeter Bofors will fire 120 shells from each barrel in one minute.

In the center is Bob Feller, star baseball pitcher, a Navy Chief Specialist and gun crew captain.



stay at N.O.B., some members of Crew 21 will receive a total of 210 hours of training in these several subjects while others, Gunner's Mates, Machinist's Mates, and Electrician's Mates, who are numbered among the ship's specialists, will put in the same amount of time, but with emphasis respectively on fire-arms, power plants, and electrical matters.

From all this it would appear on the surface that while it takes only four weeks to make a proficient DE-man, their brothers-in-arms, the PT-men, require twice that time. However, that is not all there is to the story. The PT-boat, as we have seen, is a very small craft with a crew of nine men and two officers, whereas the DE is but slightly smaller than a destroyer with a complement of about 190 men and officers. Included among the crew of a Destroyer Escort are several officers of junior rank as well as a number of Chief Petty Officers, each of whom is a specialist in his own calling. The responsibility for the operation of the various phases of DE-activities rests with them, and although DE-men are coached in a variety of matters, they are not expected to be competent to perform every job aboard ship, as are the PT-men. The loss of one enlisted man on a mosquito boat is serious, because there are only nine to begin with. Proportionately, and from the standpoint of numbers only, the loss of a single crew member from a PT would be equivalent to the immobilization of about 44 enlisted men from a DE.

Better to absorb sub-busting technique, Crew 21 will be broken into small groups or units, and, save for a few instances, will continue in that fashion throughout the course. For three and a quarter hours, from 0800 to 1115 that first Monday morning, one group will take up General Seamanship. Other units will put in one and one-half hour periods in Ship Familiarization—also known as “Mock-up Ship”—Pointing-Training, Loading Drill, Eye Shooting, and the 20-millimeter machine gun. All these classes will be held in one of the big hangar-like buildings, known as Building A-Prime. Electrician's Mates and

Gunner's Mates will go to another structure where the former will spend the entire day on generators, studying commutation, interpoles, compensator windings, structural features, and other technical things. The future gunners will spend their day discussing ammunition, safety precautions, and handling of various arms.

The class in seamanship receives a general lecture on that subject, and while each man has had at least rudimentary seamanship work in "Boot Camp," he is reviewed in classes and types of boats and the terms referring to them. He learns more about the boat gear carried, the emergency medical chest, emergency provisions, and their importance. Then there are stowage of boats, boat salutes, and the duties of the boatkeeper.

The business of standing watches when under way and at anchor comprises part of the necessary knowledge of the broad subject of seamanship, and this includes the work of sentries, orderlies, messengers, life-buoy lookouts, and mast head lookouts. Then there are details of various special watches, such as the speed watch, the night speed indicator watch, the flag speed indicator watch, fog and buoy watches, and so on.

Later in the first week each group will receive two periods of instruction in "Knots and Splices," otherwise known as Marlin-spike Seamanship. Back in the days when warships depended on sails and the wind for motive power, a seaman really had "to know the ropes." There were undoubtedly far more fathoms of rope and cordage in the rigging of the *Bon Homme Richard* or the more massive *Constitution* than are to be found aboard a modern Destroyer Escort, but the importance of properly tied knots and the splicing of rope has not lessened down through the years. To coil or uncoil a long length of one-inch Manila rope without snarls and tangles is a tricky business, and as ropes and hawsers at sea are often synonymous with some sort of emergency where quick, decisive action is demanded, snarls and tangles are not in the lexicon of a good seaman.

To obtain practical instruction in knots, the men sit on long benches around a roped-off square, much like a small boxing ring, and known as the rigging loft. From the heavier rope which is supported by posts are suspended short lengths of smaller rope. Working on the floor of the little arena the instructor demonstrates one of the required knots, after which each man tries it with his lighter, suspended rope and has his effort inspected and criticized. Sixteen fundamental knots and splices are taught, including the overhand, square knot, figure eight, bowline, running bowline, bowline on a bight, single and double sheet or becket bend, half hitch, two half hitches, clove hitch, timber hitch, timber with half hitch, round turn and two half hitches, eye splice, and short splice. To augment actual practice, the men attend a motion picture, "Useful Knots."

To former Boy Scouts many of the simpler knots and some of the more complex ones will be familiar, even though Scouting may have been left far behind some years ago. There's a fascination in the ability to tie good knots that gets under the skins of Boy Scouts, fishermen, and particularly sailors. It isn't unusual to find one or more of a group of sailors, in training station or aboard ship, toying with short pieces of small rope while doing their part toward "shooting the breeze."

One branch of seamanship instruction which all men like, particularly in pleasant weather, is that devoted to the pulling boats and the power boats. At N.O.B. each group of students is transported to the lagoon for two three-hour drills with the former and one six-hour session with the latter. The lagoon is a sizable bay with an exit under an arched bridge to the larger expanse of Hampton Roads. Ironically, the bridge is a relic of the Japanese exhibition constructed in 1907, when the lagoon and a great part of the present site of N.O.B. were used for the Jamestown Exposition.

Moored at a floating dock are a number of regular Navy pulling boats, propelled by ten oars. Acting as steersman, an instruc-

tor selects a crew of ten and takes them out into the lagoon to master the first principles of handling the long and heavy oars. To many a new sailor, born and brought up in inland country where there are few if any lakes, the manipulation of an oar is a tricky piece of business. It just doesn't seem possible that an oar can get itself into so many places where it doesn't belong. To refrain from swatting somebody else behind the ear, to feather the blade in the process of the stroke, to keep in perfect time with the stroke oar are all elementary, but they must be learned. Other men who come from states abounding in lakes and rivers may be familiar with the small rowboats, but they find that a regular Navy lifeboat is far different. Both boats and oars are much heavier, and they learn that in the Navy one doesn't "row a boat"; one "pulls an oar."

But the class in pulling boats is fun. Once the crew has mastered the first rudiments, and if the water is relatively calm, the instructor takes them under the old Japanese arch, out into Hampton Roads. Lying at anchor in the distance may be a number of battleships, always a thrilling sight. Overhead is an almost constant roar of aircraft, both sea and land planes, and, if the crew is very lucky, one of the new Destroyer Escorts may be coming into port or putting out to sea. Later, each man will take his turn at the tiller, the lever which controls the rudder, and he will learn to give the commands of "Up oars," "Let fall," "Give way together," and the many others necessary to control a pulling boat.

Davits, the metal structures used for lowering a ship's boat to the water, have been constructed on the wall along one side of the lagoon, and here the men learn how to manipulate the falls, or tackle, which lowers and raises the boat. As the water is some fifteen feet below the top of the wall, they find that lowering a boat full of men is a task requiring strength and nicety of co-ordination.

The day spent in the power boats is likewise both pleasant and



"Praise the Lord ...



... and pass the ammunition ...

... and we'll all stay free!"



instructive. Each sailor takes a turn at handling the painter, or bow rope, in making a mooring or casting off. He also serves as steersman and finds that this job calls for quick thinking. The engine in these small power boats is located amidships, and is operated by a sailor specially trained and assigned to the task. Commands for the operation of the boat are given by the steersman with the aid of a large brass bell suspended in a frame near his elbow. To the clapper of the bell is attached a short rope which the steersman constantly keeps in one hand, while the other rests on the tiller. One clang on the bell tells the engineer to go forward, two clangs order him to disengage the clutch and let the boat coast through the water, and three smacks with the clapper call for reverse gear.

When first coming in to the landing, the neophyte steersman is very liable to get his signal mixed, for he must also concentrate on steering the boat, and almost anything could happen. However, it seldom does, for the engineer has been in the Navy a long time and knows what the youngsters are up against. If he receives the one-bell go-ahead signal when the steersman meant three bells for reverse to slow down the ship before coming to the dock, the engineer nonchalantly shoves his lever into reverse and grins sympathetically. The instructor explains quietly at the first mistake, scolds mildly at the second, but if it happens a third time, the unfortunate steersman will get a good keelhauling, which is Navy for a bawling-out.

All told, the seamanship portion of a DE-man's training is interesting and fascinating. There are many things to learn to do with the hands, and there is much to be mentally absorbed in the 30 hours devoted to lectures, movies, and actual physical practice. The 30 hours do not come consecutively, or even all in one week, but are distributed throughout the first 21 days.

“HAVE FAITH IN YOUR SHIP!”

IN THIS WAR MORE THAN any other in its history, the United States has had to *learn* to fight. The business of taking up arms in defense of what is rightfully ours and what we mean to keep despite Hitler, Hirohito, hell, and high water has become very much more technical in every minute detail. This is true to such an extent that training, even for the most inconspicuous of war jobs in the armed forces, is a thousand-fold more important than ever before. Literally millions of men and women have had to learn to do things they never, not in the wildest flights of imagination, thought they would be called on to do. They have had to assimilate knowledge of things and actions as far removed from their normal course of lives as the English alphabet is from the untutored savage, and they have been forced by circumstances over which none of us had control to do it quickly.

Some of the study and training is vibrantly interesting and thrilling; much of it is little short of mental and physical drudgery, but all of it is vital. Perhaps it will never be officially acknowledged, but great credit is due those responsible for preparing the various curricula. They not only have condensed much into little, but they have done their level best to imbue the many courses with knowledge which has prime value, and because of its value, it arouses and holds the curiosity and interest of the trainee. Notwithstanding all this, what is it that actually makes training train?

The Bureau of Naval Personnel, known familiarly as "Bu-Pers" in the Navy, is responsible for arranging and publishing most of the Navy educational books and pamphlets. It also publishes a monthly magazine called *The TraDiv Letter*, for the Training Division, to aid its thousands of instructors. On the subject of what makes training courses click, *The TraDiv Letter* had the following to say, editorially:

"What makes training train? How does untrained manpower bring itself to the point where it can do the jobs to which it has been assigned? More particularly, how can the instructor bring about this change?

"The theories which answer this last question fill libraries of books, and the war won't wait while they are being read. However, with the aid of some simplification, the problem may become clearer and the training easier.

"Consider the three elements the instructor has to work with—the MAN, the WILL-TO-LEARN, and the JOB to be learned. These three things are necessary to any training situation if learning is going to result.

"The MAN cannot learn unless he has the proper level of intelligence, the physical ability, and the experience to train for the JOB.

"The WILL-TO-LEARN has been variously termed 'morale,' 'fighting spirit,' 'interest,' and so forth, but it must be there before the MAN will gain anything at all from his training. Most Americans have little difficulty in assimilating even difficult material when they come to the realization that they are really fighting the war thereby.

"Finally there is the JOB. The best way to learn the JOB is by doing the JOB itself. If that is impossible, actual JOB conditions should be simulated as closely as possible, instruction should be closely related to the JOB; it should be varied; it should cover every possible point of confusion, for this part of



Heavy weather gear.

learning is as important as the MAN and the WILL-TO-LEARN. If instruction is made uninteresting, confused, abstract, the WILL-TO-LEARN will be wasted, and the MAN will go out to fight, untrained in his JOB. His effort may be wasted. He may even be killed through lack of proper skill.

“‘Got to be damned sure no boy’s ghost will ever say, “If your training program had only done its job!”’”

In a nutshell, that editorial typifies the efforts of the Navy schools and the instructors in them. The results of careful, thorough training, physically and mentally, have already begun to show. Perhaps the best testimonials to the efficiency of the schooling which our armed forces have been inculcating into American youths could come from two men, whose addresses are known as Berlin and Tokyo; and from a third, who once lived in Rome.

Adhering to the admonition to simulate the actual job conditions as closely as possible, this war has brought out what are popularly known as mock-ups. These are reasonably exact replicas of instruments and weapons of war and the conditions under which they may be utilized. We have mock-up planes, tanks, and jeeps; there are mock-up jumps in the strenuous training of the paratrooper; the well-known Link Trainer is a mock-up airplane in which the pilot learns his lessons and takes his tests. It is not surprising, therefore, that at both the Miami and Norfolk schools for DE-men and their officers there are mock-up ships.

One of the illustrations shows the simulated, dry-land version of a PC (Patrol Craft) ship, complete in every above-deck detail, even to “Oscar,” the mascot, who stands perpetual watch in the Crow’s Nest. From southern Florida shipyards and yacht basins came all manner of gear to improve the ship as an aid to training. The bridge is equipped with binnacle, pelorus, wheel, and engine room telegraph. The mock-up ship is moored

"HAVE FAITH IN YOUR SHIP!"

to cleats and is a center of constant educational activity. While one class of seamen learns to handle the wheel, another studies signal code from the blinking mast lights.

At Norfolk, the theory of job simulation has been approached in slightly different fashion. There is a full-scale model of a DE made of wood. While it doesn't pretend to contain all the machinery and other working parts of the real DE—these are already available in various laboratories—it does give the future sub-busters a lifelike hull, topsides, and a below-deck replica through which they can better familiarize themselves with the real thing.

Work with and study of the mock-up ship comes under the general heading of seamanship, and includes three one and one-half hour lectures. These lectures, or talks, for they are as straight from the shoulder as any discourse one man can give to another, are delivered by Chief Petty Officer C.G.M. Shilson, who still holds the all-time Navy record of being the youngest man ever to become a Chief Petty Officer. That was a long time ago, for C.P.O. Shilson has served in Uncle Sam's Navy for nearly 50 years. Not only was he active during the last world war, but also he was with the fleet when Admiral Dewey wrecked the Spanish navy in the Battle of Manila Bay, in 1898. After that battle was over, it was Shilson who planted the first American flag on the island of Luzon.

Not in spite of his age, but rather because of the long service his many years have permitted him to put into the Navy, C.P.O. Shilson gives Crew 21 and all other crews that attend the DE-school one of the most inspiring talks about ships in general and DE's in particular that it will ever be their privilege to hear. Nobody ever falls to sleep in mock-up ship lectures. To the contrary, it isn't at all unusual for the entire class to break out in spontaneous applause when it is over.

"All ships are dead things of iron and steel, until the crew

takes over," says Chief Shilson. "Then they come to life, and there is no such thing as a good ship or a bad ship—good ships come from good crews. There are three things that make a good crew—discipline (he pronounces it discipline), cleanliness, and consideration." As for the officers of a ship, this steeped-in-the-Navy veteran, who himself came up the hard way, stoutly maintains that American naval officers are the best in the world, that they are good leaders in every sense of the word. "They can take it," he says emphatically, "and a man who can't take it should never be allowed to give it. In our Navy, they aren't."

On a table in the front of the classroom is an exact model of a DE, some four or five feet long. On the wall hangs a large cut-away drawing, showing the location of all the sections and compartments of the ship. As he speaks with particular reference to the DE's, Chief Shilson implores the new sailors to have consummate faith in their ship, and his entire talk develops a strong feeling of safety and security in the vessel which will be their home on the high seas.

But this sort of thing is not mere talk. The DE, points out the instructor, is the result of years of study on the part of the best naval minds in the United States and other nations. Profiting by our experiences with German and Austrian submarines in the last war, and possibly realizing sooner than others that we might have to contend with them again, a special Navy commission, headed by Rear Admiral Cochrane, now Chief of the Bureau of Ships, went to England early in 1940 to inquire into all aspects of the convoy problem. After four months of careful study, Admiral Cochrane visualized a ship larger, faster, and more heavily armed than the already well-proved British corvette; one which would be adequate for the arduous trans-Atlantic work, and which would function in convoy duty as satisfactorily as a destroyer.

As a result of the commission's investigation, the Chief Petty



Emergency rations on life rafts are regularly examined.

The lookout constantly scans the horizon.



Officer explains, Navy ship designers put their heads together, pored over their drawing boards, and came up with plans for a vessel of simple construction which could be built faster and cheaper than a Destroyer. There was no sacrifice of sound and seaworthy qualities in the design of the 1300-ton Destroyer Escort, and provisions were made to include the latest marine innovations, both in warfare and navigation, some of which are still "hush-hush." While armament is lighter than that of a Destroyer, it includes weapons proved in combat to be extremely effective against submarines, aircraft, and surface ships.

"Know your ship!" thunders Chief Shilson, as, with pointer in his gnarled fist, he indicates salient features in the wall chart and the table model. The men learn that a DE is very hard to hit with a torpedo. They are told their new warship is 300 feet long at the water line and 308 feet overall, that it has a beam of 35 feet.

"She's hit!" cries the Chief with dramatic suddenness. "What about it?" And with that he tells the story of the *Titanic*, so heavily press-agented before her maiden voyage in 1912 as being the "unsinkable" vessel. He points out that that magnificent ship actually was unsinkable in the eyes of marine engineers. It, too, had sufficient watertight bulkheads to have floated her after the collision with the iceberg, but the bulkhead doors were not properly closed and other safety precautions were ignored. In short, says the Chief, members of the *Titanic's* crew did not sufficiently "know their ship."

To drive home his point of the safety and security built into modern warships, he recites the tale of the German battleship, the *Bismarck*, which was on the receiving end of 13 torpedoes and 100 16-inch shells before she finally was sunk. Battered and smashed, the *Bismarck* still tried to elude her pursuers, but one torpedo had damaged the steering gear, jamming the rudder. This caused her to run in circles and made her an easy target.

Then, continues the aged instructor, there was the Japanese warship which was hit with seven torpedoes and eleven bombs, yet still floated. In this instance the fire aboard finally became so hot and so severe the Japs opened the sea-cocks and sank their ship. "Those crews," he concludes, "believed in 'compartmentation.' The *Titanic's* crew didn't. Trouble comes so fast there's no time to close the doors and hatches after it starts. Ninety percent of protection lies in the protective qualities of your ship. Use those qualities and you'll live longer and fight longer."

If a vessel is to stay afloat, the upward pressure of the water must be equal to the downward pressure, or weight, of the ship. With the inrush of the sea through a torpedo hole in the hull, the weight is greatly increased, but it does not necessarily follow that the ship will sink. There may be sufficient buoyancy left in the undamaged compartments to maintain a balance of the upward and downward pressures. This was true in the case of a torpedoed merchantman. The crew took to the lifeboats, but stayed near by all night. In the morning as the ship was still afloat, the men went back aboard, obtained help from another vessel, and were towed into port. An 11,600-ton tanker was split in two by either mine or torpedoes. The forward section floated all by itself, and was towed safely to Norfolk. The 300-foot after section was later salvaged from 32 feet of water, brought to the shipyard, and the two parts were welded together.

Before they leave Norfolk, Crew 21 will hear considerable about the subject of damage control and the Damage Control Party, which is anything but a social function. Right now, in mock-up class, they learn that when a ship is hit, the Damage Control Party, a group of highly trained specialists chosen from members of the crew, goes to work—and fast! It is their business to make instant and emergency repairs so the vessel can stay afloat and in the fight. Some sea battles and many fights between

surface ships and airplanes last an incredibly short time, perhaps as little as five to ten minutes, during which every man-jack lives two or three lifetimes. But it is during these brief, as well as longer, engagements, that the Damage Control Party works like demons.

It is their business to do the best they can with what they have as fast as they can. Jagged rips in hulls from shells and torpedoes have been temporarily plugged with mattresses, blankets, pillows, canvas—anything that will momentarily keep out the sea. Then, when things have cooled down and there comes a chance to check up on damages to the ship and injuries to the crew, the Damage Control Party becomes the Damage Repair group, and, with more time and the emergency partially under control, they endeavor to improve on their own handiwork. Fighting fires aboard ship is another matter that will be gone into in more detail, but by way of further impressing Crew 21 with the safety factors of a DE, the men are told even the paint used on both exterior and interior is of the non-inflammable type.

“Have faith in your ship,” pleads Chief Shilson in conclusion. “She’s one of the best ships ever built, and with her twin propellers and twin rudders she can dodge and maneuver like a fast-running quarterback. She’s heavily armed, as you men know. So much so that the story is that Hitler has ordered his subs to stay away from DE’s. Sinkin’ DE’s will never win the war for the Axis, but sinkin’ transports might. So, your duties are to go out there and get those subs—they won’t be lookin’ for you half as much as you’ll be lookin’ for them.

“And finally, men, the Navy today is new. There’s no old-timers, like me, aboard your DE. It’s your ship—it’s your brain—it’s your responsibility—it’s your country—it’s what you’re fightin’ for, and it’s YOUR Navy. You fellows want to get to look at the Navy and all it stands for like this—It ain’t his Navy, it’s MINE.”

Chapter Eleven

THE ABANDON SHIP DRILL

TIME WAS WHEN THE Navy wasn't too particular about a sailor's ability to swim, but things are different now. If a new recruit doesn't know how, he gets his first lesson early in "Boot Camp" days, and the chances are very good that before the Navy is through with him, he'll be able to take care of himself in the water. In the eyes of the Navy, the importance of swimming is borne out by the fact that at the enormous Great Lakes Naval Training Station, in Illinois, 50,000 swimming lessons a week are given by 50 instructors. Despite this emphasis, however, there are a few lads who just can't seem to learn how to keep afloat.

To develop further the ability of DE-men who can swim, and to help along those who can't, the training course at Norfolk includes what is known as the Destroyer Escort Aquatic Program. "The ability to swim," states the aquatic instructor, "is one of the most important achievements for a Navy man to acquire. It is the foundation for instruction in life saving and water safety devices. Together, these comprise the best insurance on a Navy man's life when confronted with desperate situations at sea."

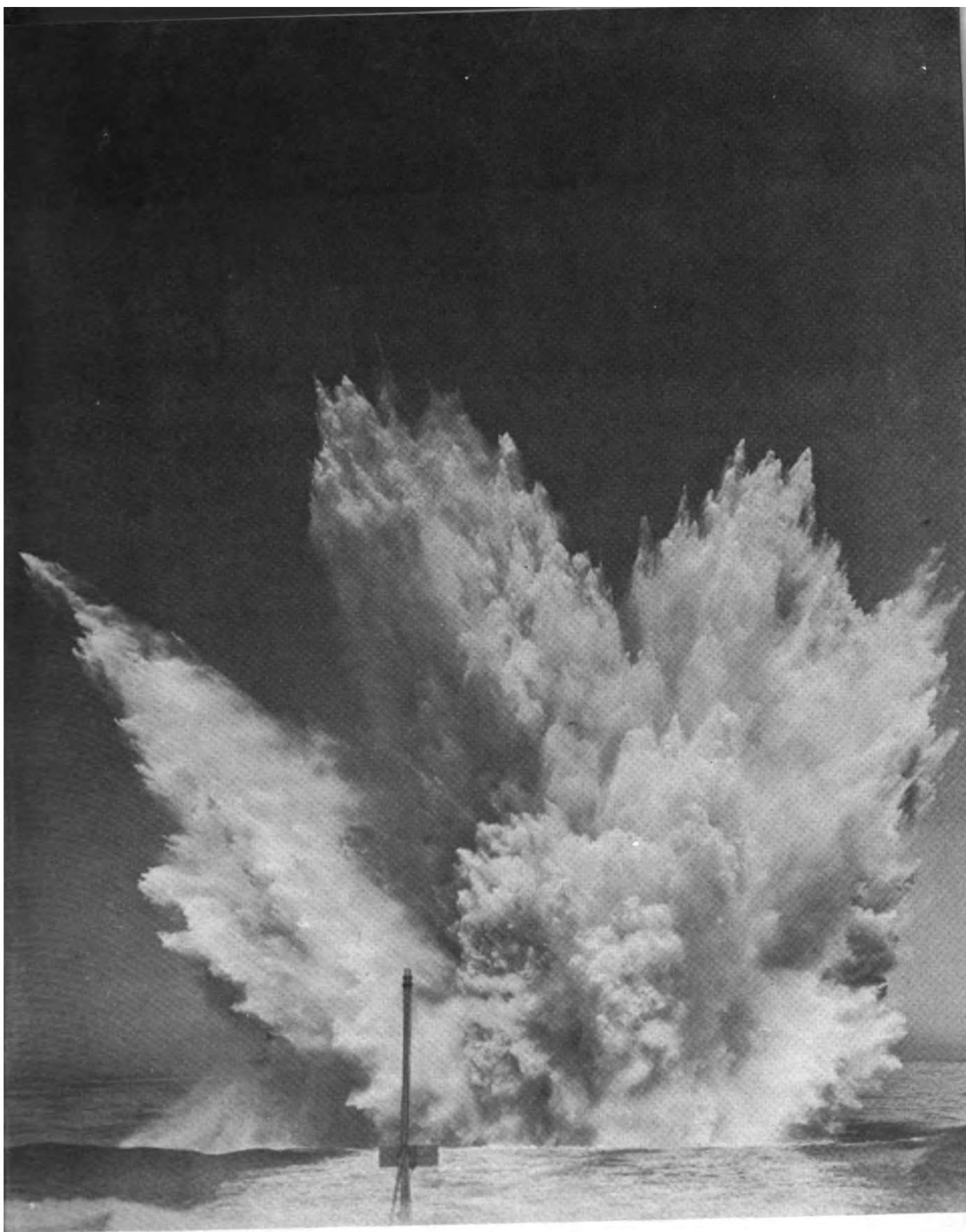
At N.O.B., the aquatic program is broader than merely a course in swimming. It teaches men the Abandon Ship Drill, and makes them proficient in all its phases. It attempts to build up the individual's confidence in himself when in or on the water. The non-swimmer is given an opportunity to learn, the

mediocre swimmer has a chance to improve his skill. The men find out about rafts, and how to handle them, as well as life lines, life jackets, preservers, and other safety devices. The DE-Aquatic Program conditions and prepares men for sea, and offers a maximum amount of training in a minimum amount of time.

At the first hour and one-half session, Crew 21 is divided into the three groups known as swimmers, novices, and non-swimmers. The first group comprises those who demonstrate that they can swim 50 yards using any style of stroke; that they can keep afloat for five minutes by treading or sculling; and that they can dive feet foremost from the "deck" into the pool. The mediocre swimmers end up in the novice group, and are required to swim the 50 yards and to take the feet-first dive. Any man who cannot complete the 50-yard swim is considered a non-swimmer. When these three categories have been determined by the instructors, each group is put through its separate course, but all will go through the Abandon Ship Drill several times before they leave N.O.B.

Thanks to the far greater interest which this nation has taken in the art of swimming during the past 15 or 20 years, and to the increase in public swimming facilities, even in areas where streams and lakes are scarce, the aquatic instructors of DE-men at Norfolk find relatively few who are not at home in the water. In a three-months' period, 16,892 new sailors took the required test and only 2400 failed to pass. Of these, 1076 succeeded in qualifying after instruction, leaving but 1324 who were unable to master the art in the 12 lessons given to non-swimmers in the course of attendance at the DE-school.

The first move toward helping the non-swimmer is to try to give him the proper mental and physical adjustment to the water, to overcome his fear, and to build up his confidence. This is done with the aid of buoyancy drills which teach the lad to



One reason Hitler fears the sub-busters.

submerge his face in the water, to exhale while under the surface, and to open his eyes. When fear has been overcome and confidence built up to some extent, the pupil is asked to hold his breath while he sits on the bottom of the pool, or to sink to the bottom on his stomach or back. He soon finds that so long as he holds his breath, he cannot stay under water, but by exhaling completely and then holding his breath, the maneuver can be accomplished. The jellyfish float is another exercise which demonstrates buoyancy. With head down, knees held tightly to the stomach, and the body in a ball formation, the non-swimmer is often surprised to find that so long as breath is in his body, he does not sink.

Slowly and carefully, so as not to give rise to fear, the pupil is taken through the practice of propulsive movements in the water. He learns leg kicks, strokes and their necessary co-ordination, with emphasis on the "dog paddle." The feet-foremost dive is very important and should be accomplished with the legs close together and crossed. The arms are bent at the elbows, raised from the sides and crossed on the chest below the mouth and nose. This will guard the jumper's face from the blow of the water and serve as protection from burning oil on the surface. Before this jump or dive, all headgear should be removed, and the head should be kept back, with chin drawn in. Those who find that the feet-foremost dive forces the water up their noses are told to hold their nostrils with the fingers of one hand, still keeping the arms crossed.

Other swimming feats are assiduously practiced. Crew 21 learns to swim without using its feet, to keep afloat by means of the arms alone, so that in case of leg injury, there is still a chance of survival. They become good underwater swimmers, reaching the point where surprising distances are covered below the surface, a feat which would be of great help should they ever be pitched into a sea covered with flaming oil. Another

trick for navigating through burning gasoline or oil is the bobbing-breathing method of underwater swimming. The technique of this calls for the treading motion with the feet while the body is held in a perpendicular position just beneath the surface. The hands are kept in front of the body, and by using a paddling motion, progress can be made. Of course, it is necessary to come to the surface for air, but before doing so, the swimmer looks upward to make sure there is no heavy debris or fiercely burning oil directly above. By making an overhead sweeping motion with the hands and the arms just as the body emerges on the surface, light debris and small patches of burning oil are momentarily separated and brushed aside. The swimmer then brings his head out quickly, takes a breath of fresh air, and once again submerges. It is not an easy thing to do, but practice and properly co-ordinated breathing will simplify the process.

Sooner or later the drills are practiced with the men fully attired. They are also taught to remove their clothing while in the water, and surprisingly, a pair of Navy Blues or Whites will make an emergency life preserver. The sailor removes his pants, ties a knot at the end of each leg, and buttons up his famous thirteen buttons. Holding the top of the pants with one hand and the back of the waist with the other, he leaps into the water, remembering to suspend the pants overhead, like a parachute, so they will fill with air on the way down. After coming to the surface, he encircles the middle of his trousers with one arm and finds he has two "balloons" which will support him for approximately 20 minutes. Then, utilizing a savage kick of the legs to raise him above the surface, he swings the pants quickly in a circle and refills them with air.

When the non-swimmers and the novices among Crew 21 have progressed far enough with their training, they are put through the Abandon Ship Drill, which the better skilled men

have already practiced several times. This drill is conducted in the pool, which is 10 feet deep at one end and four feet at the other. Near the deep end of the pool a platform has been erected to 12 feet above the water. From this platform hang life lines, large hawsers, two rope ladders equipped with wooden steps or crosspieces, and a huge cargo net, and all extend down to the surface of the pool where they can easily be reached by swimmers. Between the platform and the shallow end of the pool are moored three obstacles; a large life raft, a spar, or timber, and a small life raft.

There are four separate drills to be practiced until the men become proficient, and then the final drill, or test, which combines parts of all four. Drill Number 1 calls for a 50-yard swim with either the breast or side stroke, at the end of which the swimmer must climb up the rope ladder to the platform from which he is to make a feet-foremost dive with arms properly folded, and then swim to the edge of the pool and "hit the deck," or clamber out. Drill Number 2 consists of a 25-yard swim on the back, a climb up the cargo net to the platform, a climb back down to the water by using the hawser, a swim by any stroke to the rafts and the spar, which must be crawled over, and a swim to the edge of the pool. Drill Number 3 varies from the second only in that the descent from the platform is by means of the ladder rather than the hawser, and Number 4 is comparable to Number 1, save that the swimmer may ascend to the platform by any means he desires.

The fifth and last test is the full Abandon Ship Drill, and is really tough. Any man who can successfully surmount the series of obstacles and "hit the deck" at the finish with strength and breath left in his body may consider himself in excellent physical condition. A dozen members of Crew 21, who are ready to try the final test, line up at the shallow end of the pool. Twelve life vests are tossed into the deep end, and at the signal, the men



A Torpedoman carefully prepares the charged tube for firing.

It takes a good man to "stand throttle watch."



dive or jump into the pool. There is much splashing and thrashing of arms and legs as all swim to the large raft, and, of course, the first to arrive have an easier time climbing aboard than do the later ones. When 12 men are trying to crawl onto one raft at the same time, the raft will tip and bob about in a very uncertain manner.

In this race no time is wasted sitting on a raft. Once aboard, each man catches a deep breath, plunges helter-skelter from the other side, and strikes out for the large spar which now lies across his course. Reaching this, he wraps his arms about it, sometimes even his legs, and clings momentarily to simulate the use of pieces of floating wreckage as life preservers. Next comes the small raft, which, under the assault of the 12 furiously swimming men, is even tipsier than the large one.

On and over they go, whereupon they set out for the deep end of the pool and the floating life vests. Seizing a vest, each man struggles into it while treading water to keep himself afloat, by no means a simple trick. Then back go the swimmers toward the shallow end until they are directly under the overhead platform. Life vest and all, they must go up one of the rope ladders, which may sound easy, but which actually is an art all in itself. The ladder sways and swings, and as a foot comes up to a higher rung, the knee may bump it, causing the ladder to swing still more. But if this climb is difficult, with the ladder fastened to a stationary platform, the same stunt at sea, when the platform will be the heaving and rolling hull of a ship, will be doubly tough.

Quite a number of men, even good swimmers, hesitate before the next obstacle. It is a jump, feet first, down the 12 feet to the water while wearing the life vest. The vest doesn't complicate the situation or make the jump any more difficult, but to many lads as well as to older men, a dozen feet through the air can look like a very long trip. Eventually, most of them conquer their

fear and take the leap, with arms crossed properly over their chests and the life vests. As soon as the men bob up to the surface, another climb awaits them, this time up the cargo net, which weaves and sways with the weight of the climbers far worse than did the ladder. Again there is the feet-first jump, followed by a swim directly back to the starting place, where all are glad to hit the deck for a breathing spell.

One important result of so strenuous an aquatic program is that it develops each man's confidence in his own ability to take care of himself and to be of assistance to less fortunate shipmates. Despite the teachings of the Mock-up Ship class to stand by the damaged vessel, the best of warships must at times be abandoned, and, when that time comes, the knowledge that even a stricken ship may retain some buoyancy, and the ability to jump safely into the sea and to swim, is a valuable combination. It serves to make the men calm and unhurried, to make them think what they are doing, and hence, to save many lives. Extremely sudden sinkings have been rare, but casualties brought about by panicky men leaping into heavy seas, or flaming oil, have been frequent.

Many splendid examples of coolness and courage on the part of American naval men, when faced with the necessity to leave a sinking or burning ship, have come out of this war, but none is more outstanding than the loss of the aircraft carrier, the *Yorktown*. Men by the hundreds went calmly over her side, some sliding down ropes, others taking far more than a 12-foot leap from the deck to the ocean. Out of the entire complement of men, all but a few were saved. Had panic reared its ugly head, however, the story might have been far different.

At the Submarine Chaser Training Center in Miami, Florida, where DE-officers and some of the men are trained, is what the Navy calls a "training aid." It is a rather gruesome sort of "aid," and is shown in one of the illustrations as the bullet-

116 HE'S IN THE SUB-BUSTERS NOW

riddled lifeboat. It was picked up by one of the Miami school's training ships and as a grim reminder of the enemy's ruthlessness toward men who have been forced to abandon ship, it has inspired many a new DE-man to fresh effort in his rigorous training program.

One means of communication is blinking messages in code.



Chapter Twelve

GUNNERY PRACTICE AT DAM NECK

THE CRASHING ROAR OF the 3-inch and 5-inch cannons, the rhythmic pounding of the 40-millimeters and the "Chicago Pianos," the staccato challenge of the saucy little 20-millimeter machine guns all blend into one deafening din to the ears of Crew 21. At least it seems that way out on the firing range at Dam Neck, for most of the boys have never before heard a cannon fired, and many of them are unfamiliar even with the insignificant "ping" of a .22 rifle. Their ears stuffed with cotton, Crew 21 stands dutifully, and in some awe, back of the long concrete strip that runs for a quarter of a mile along the beach. On this strip are mounted several of the cannon, a few 30-calibers, a couple of the 1.1-caliber guns dubbed "Chicago Pianos" by the British, and scores of the "20-mills," their muzzles all pointing out into the Atlantic, prophetically, perhaps, toward Hitler's European Fortress.

Approximately a thousand new sailors are at Dam Neck today to receive training in gunnery. They include prospective DE-men, like Crew 21. There are members of the Armed Guard, the men who comprise the gun crews supplied by the Navy to each merchant ship. There is a squadron of PT-men, brought in to receive some last-minute practice before shoving off for "somewhere" and actual battle, and there are always neophyte gunners for the Navy in general, men who will serve aboard cruisers, destroyers, battlewagons, carriers, or other fighting ships. Today, Crew 21 is but a small part of the class in gunnery,

and as they stand by, awaiting their turn, they try to recall all they have learned in classroom regarding the theory of operation of the guns and the duties of each member of a gun crew.

Floating arsenal that she is, the Destroyer Escort's classification as a specialty ship calls for a crew of highly trained officers and men who are capable of making the most of the vessel's effectiveness from her powerful engines to the depth charge racks, from the booming 3-inchers to the chattering but highly effective fire of many "20-mills." All potential DE-men are given 55 hours in gunnery and firepower, and in that brief time they must absorb a tremendous amount of theory and working knowledge of arms and ammunition.

The primary job of a Destroyer Escort is to track down and sink enemy submarines. This is accomplished either by offensive forays or patrols into known submarine areas, or during the course of protective convoy duty. In the latter case there are two other forms of enemy attacks against which the DE must ever be on guard—aircraft and surface ships, which likewise are pitted against our ceaseless efforts to deliver supplies of war. Like all good specialists, the DE is properly equipped to do a specialist's job.

It is not expected that the new men will be the world's most expert gunners when they board their ship, but they are supposed to have had enough basic knowledge and practice to enable them to operate their guns. Once aboard, there will be seemingly endless hours of further practice to attain proficiency and the all-important teamwork necessary with modern engines of war. Every day of the shake-down cruise will see the gun crews at work, and every day thereafter they will spend hours and hours at their respective positions until they function faster and far more smoothly than the best-trained football team.

Back at N.O.B. the boys sat on wooden benches ranged around one of the 40-millimeter, or Bofors, guns and listened to the

instructor tell of its capabilities. Located at Bofors, Sweden, 143 miles west of Stockholm, the Bofors Company is privately owned and has been manufacturing arms since 1884. Dr. Alfred Nobel, of Peace Prize fame and inventor of nitroglycerine explosives, was president of the company for several years prior to his death in 1896. After the first World War, the Krupp Company, restricted in arms manufacturing activities in Germany by terms of the Versailles Treaty, acquired large interests in Bofors. The two organizations pooled designs and ideas and continued on this type of working agreement until 1937, when the Swedish Parliament passed a law prohibiting such foreign ownership, and the Krupp interests were forced to withdraw.

Several years before Hitler gave the order to invade Poland, automatic anti-aircraft cannon of various medium calibers were under development in a number of countries, including the United States. Out of the controversy which arose over the respective effectiveness of the 40-mm., the 37-mm., the 25-mm., and others, Great Britain became partial to the 40-millimeter, and in 1940 we subjected the Bofors to exhaustive tests at the Aberdeen Proving Grounds, in Maryland. There have been tales that it was this gun which enabled the British to make their amazing withdrawal at Dunkerque, that it was the lack of the "40-mills" which contributed to the loss of Crete, and that German flyers will shun areas known to be protected by the 40-millimeter Bofors gun.

However that may be, early in the spring of 1940 we adopted what was known as the "U. S. Army 40-mm. gun M1" and contracts for its manufacture, under Bofors patents, were awarded to the Chrysler Corporation, among others. It is worthy of note that at a 1943 exhibition of Chrysler-made war products in the Chrysler Building, in New York City, an American-made Bofors was on display with the information that application of assembly-line methods reduced the production time of this cannon of

950 parts from 450 hours per gun to 10 hours per gun. Of such ingenuity is democracy's war effort composed.

In class, the lads learned that the "40-mill" is the largest automatic weapon used by any nation, that it has a range of two miles against air or surface targets, that the shells weigh a little over four pounds, that the projectile itself weighs two pounds, and that they can be shot at the rate of 120 per minute from each of the two long, rapier-like barrels which constitute a "twin," or from each of the four which make up a "quad." The principal projectile is the tracer shell, equipped with a super-sensitive nose fuze, whose main elements are the bursting charge, the tracer composition, the nose fuze, and the base fuze.

When a shell is fired, the tracer composition is ignited by the base fuze, set to operate about 55 yards out from the muzzle of the gun. The light from the burning tracer composition looks like a reddish star shooting through the heavens. It is visible in broad daylight as well as in the night, and serves to show the gun crew the trajectory, or direction, of their fire. During automatic firing the red stars of the tracers, following one another at the rate of 120 per minute, resemble a light beam, which swings from right to left, or up and down, as the gun is moved to follow the target.

When a shell hits its target, the bursting charge, an explosive known as tetryl, is detonated by the sensitive nose fuze, and the shell explodes. Due to the extreme sensitiveness of this nose fuze, the shell will burst even if it merely hits the fabric of an airplane wing. Should the target be missed, the shell will explode automatically after the tracer composition has burned itself out, for in burning, the composition ignites the percussion cap which in turn sets off a detonating pellet that explodes the shell.

Before they were brought to the firing range Crew 21 learned that it takes six men, plus the gun captain, to man a two-barreled,



Every man must be able to send and receive messages by semaphore.

Swing music makes light work of chores after chow.



or "twin," Bofors. There are two first loaders, two second loaders, a pointer, and a trainer. There is also a Chief Gunner's Mate to care for "casualties," which in this usage means some form of failure of the gun's mechanism, not wounded men.

A four-barreled Bofors, or "quad," has a ten-man crew, for there must be two more first and two more second loaders to feed shells into the additional two barrels. The classroom practice gun is mounted on a revolving platform, just as are the guns aboard ship. The gun platform can be rotated over 180 degrees by manipulation of a geared wheel at the right side of the cannon. By means of another wheel on the left side of the gun the barrel can be deflected below horizontal, or raised to a full 90-degree perpendicular.

All this, and more, the boys of Crew 21 recall as they stand by at Dam Neck awaiting their chance to fire, for the first time in their lives, real, live ammunition from a real, honest-to-goodness cannon. To say that most of them are nervous would be putting it mildly. True, they had practiced at N.O.B. with empty shells, they had learned how the second loaders must pass the huge clips, each containing four projectiles, to the first loaders; how the latter must jam the entire clips down into the breech mechanisms; how the empties automatically drop out of the bottom of the gun into the container that awaits them.

Pointers and trainers, seated on the little, iron, saddle-like seats on the left and right sides of the gun, had twirled their control wheels to revolve the platform and elevate the barrel. They had emphatically been told that teamwork is of the essence in the successful combating of an air attack, for the speedier enemy bombers remain within effective range for not more than ten seconds, and the sooner the bursts reach the target, the more rapidly can any necessary corrections be made in pointing and training the gun. But that was "dry-shooting" and largely theory. This is different. With the almost incessant cannonad-

ing, it is pretty much like the real thing. War is beginning to get close.

There is a momentary lull in the firing and—"All right, Crew 21, get aboard this 'twin,' " and six future sub- and airplane-busters step forward, a bit gingerly, to try their hands at shooting a two-barreled 40-millimeter. All are wearing combat helmets, another new experience, and all adjust the cotton in their ears. The pointer takes his seat in the iron saddle to the left of the gun, the trainer sits across from him on the other saddle, and each grasps the handles of his wheel. Each of the two first loaders stands beside the breechlock of his gun, well out of the way of the slashing recoil action of the barrel. The two second loaders do not go aboard the gun platform, but stand on the cement parkway where they can reach the ammunition supply and pass it to the first loaders. A Chief Petty Officer, one of the instructors, serves in the dual role of gun captain and Chief Gunner's Mate, and gives each lad a few last-minute reminders of his duties.

"Attention, all gun crews!" blare the loudspeakers, and the Commanding Officer of the firing range, from his station high up in an observation tower, issues final instructions. "All crews will operate under the following orders: At the command, 'Stations!' first loaders will check the safety catches; at the command, 'Stand by!' all hand-operating levers will be brought back and secured in the after brackets; at the command, 'Load!' two clips of four rounds each will be placed in each gun; at the command, 'Ready!' you will be prepared for the order, 'Commence firing!' which will follow immediately.

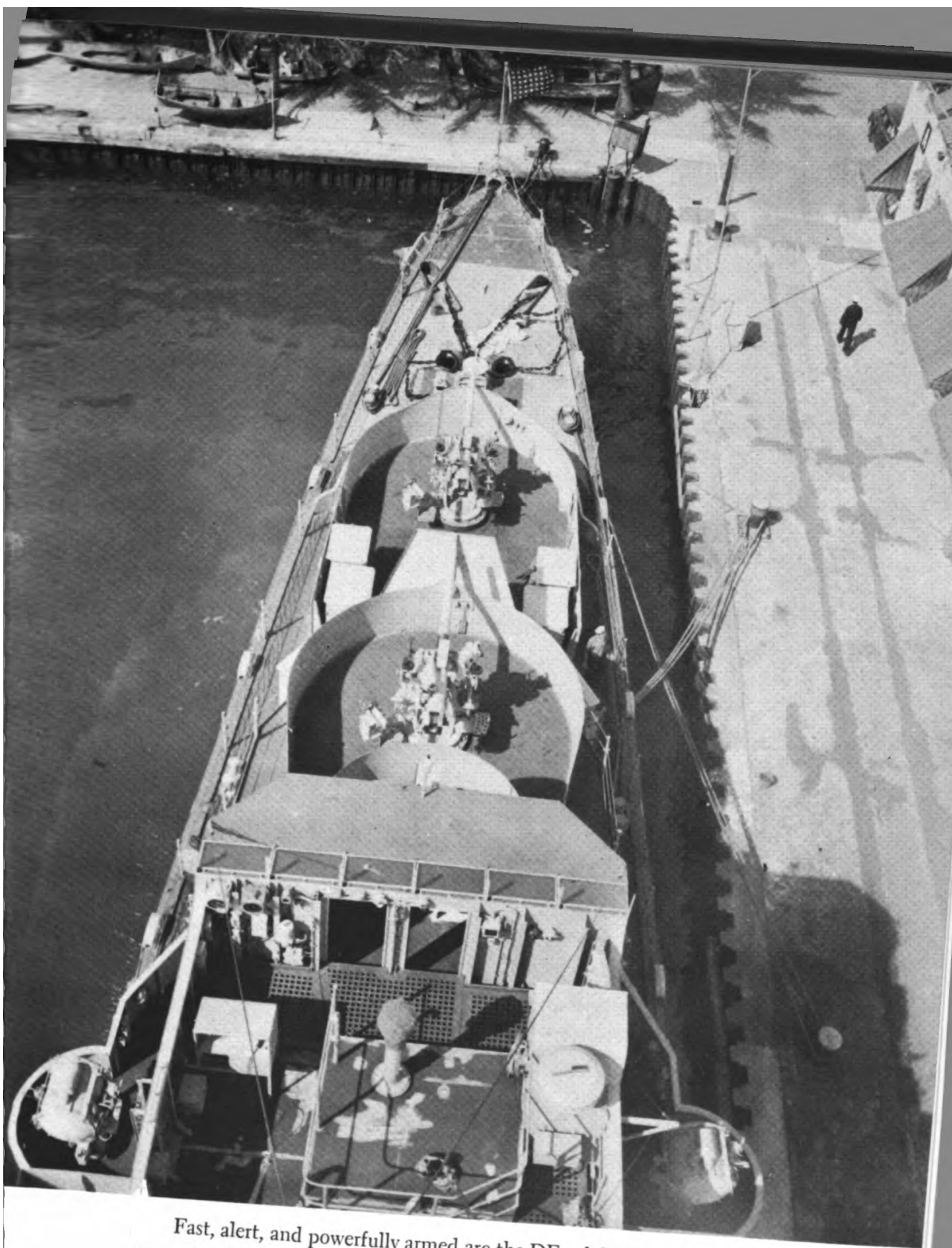
"The target will be a sleeve towed behind an airplane on a 3000-foot cable. The plane will pass over the range twice, coming in from out at sea. There will be no firing during the first pass—I repeat—NO firing on the first pass. On the second pass you will fire according to the orders just given, and you will stop

immediately on the order, 'Cease firing!'

There is a roar in the sky, and looking up, the boys see a plane flying in a great arc out to sea. Trailing behind it is the sleeve, a large strip of cloth held in cylindrical position by a light framework. The sleeve is in reality a target from 20 to 30 feet long and from three to six feet in diameter, but at the height the plane is traveling and at the distance it is from the guns, it seems very small. Now the plane completes its circle and comes in on the first pass. To get the "feel" of a moving target gun pointers twirl their control wheels elevating the barrels until they are approximately at the correct angle. Simultaneously, the gun trainers revolve their controls to bring the sights to bear on the target. It is the almost instantaneous co-ordination of these two men which, more than any other, determines the effectiveness of a gun crew.

Fast-moving, agile loaders, a top-notch gun captain, and the best Gunner's Mate in the Navy are, by themselves, helpless to score a hit on a plane. The pointer and the trainer, operating almost in the unison credited the Siamese twins, comprise the vital medium which governs rapidity and accuracy of fire. Practice, practice, and yet more practice—hours upon hours of it—is the one thing which can make or break a good gun crew, a crew which literally can spring into efficient action from sleep or at any time of the day. This is a split-second war, and as such can be fought successfully only by men and machines geared up to function in a smooth, high-speed fashion.

The technical details of the aiming and sighting apparatus of a Bofors gun are, to the layman, fearfully and wonderfully made. They are not, however, beyond the ken of properly trained American lads, gifted with an inherent sense of mechanics. The pointer and trainer may be likened to a two-man version of the bird hunter. Just as the hunter raises his gun onto the flying target, and swings the end of the barrel to right or



Fast, alert, and powerfully armed are the DE sub-busting ships.

left until he is leading the bird by the proper distance, so must pointer and trainer work in unison to accomplish the same feat with the mechanical sighting gear which enables them to attain that unison. Through an additional device, the crew member known as the "sight corrector," who is usually the gun captain, checks the course angle, the speed of the target, and the range. The sight corrector may be compared to the coach who trains the tyro hunter. He stands behind the hunter's shoulder, checks on the elevation of the gun, on the amount of lead on the target, and tells him when to pull the trigger.

The airplane has completed its first pass, the gun crews have had their last bit of "dry-shooting" practice, and the plane is coming in from the sea again. "Stations!" roars a command from the loudspeakers, and the safety catches are checked. Then, "Stand by!" which is followed by the clacking of levers being shifted to the rear brackets. "Load!" and into the breech of every gun go the clips, each containing four shells. When the command "Ready!" comes, the plane is almost directly overhead and safely out of the line of fire, but the sleeve is still 3,000 yards out there, and at an elevation of perhaps a couple of thousand feet. Hands of nervous neophyte pointers and trainers perspire as the sight corrector gives them last-second orders, and sweat rolls from under combat helmets. It seems an age until—

"Commence firing!"

The din and the uproar that ensue will be exceeded in the lives of members of Crew 21 only when they get into the real thing. For the moment, this is terrific. The barrels of the "twins" and the "quads" slash back and forth with rhythmic, roaring precision, and each time they do, a 40-millimeter shell hurtles toward the target. Pointers and trainers whirl their control wheels madly, first in one direction, then in the other, to follow the target. Second loaders pass the clips of ammunition to first

loaders almost faster than the latter can handle it. The first loaders feed the clips of shells into the hungry maws of the breech mechanisms, and empties rattle out below into the containers.

Suddenly a cry rings out. "It's a hit! Somebody scored a direct hit!" and, with the command, "Cease firing!" it is seen that the target was, indeed, struck by a shell which cut the cable and allowed the sleeve to float lazily to the surface of the ocean. Perspiring members of gun crews remove their combat helmets, wipe their foreheads on their sleeves, and grin happily at each other. Those whose knees had been knocking from anticipatory fear before the shooting started now feel quite at home with the sound of gunfire. Others, who had had some knowledge of firearms in civilian life, decide that firing a Bofors "40-mill" beats shooting a 12-gauge automatic shotgun or a .22 rifle for excitement.

To hit one of the sleeves in practice firing at the range isn't unusual, even for men who have never fired these arms before. As many as four or five of the trailing targets have been knocked down by direct hits in one day at Dam Neck, and knocking them down is only a small part of the gunnery exhibited. A trailing sleeve may be hit time and time again without being severed from its towing cable, and many of the cloth targets come back to the flying field perforated until they look like a sieve.

The experience with the Bofors gun is but one that awaits Crew 21 on the firing range. They have yet to work with the 20-millimeter machine guns, and some of them must try their hands at the much larger and more powerful three-inch cannon. With each of these guns the technique will differ from that used on the "40-mill." Each must be mastered until it isn't a case of the "know how," but rather of the "can do."

Chapter Thirteen

THE "BIG NOISE" AND THE "LITTLE NOISE"

THE REALLY "BIG NOISE" aboard a Destroyer Escort comes from the three-inch cannon. They are fast in action, accurate in shooting, and pack an extremely powerful punch. They fire three types of shells: high explosive, armor-piercing, and high velocity, and are effective weapons against enemy surface warships whose firepower does not exceed the 3-inchers in range. With a possible elevation to 85 degrees above horizontal, they become a menace to attacking aircraft. On the other hand, what one well-placed armor-piercing shell can do to a surfaced submarine is something for the Nazis to worry about.

The normal crew of a three-inch gun consists of nine men, who are known as the pointer, the sight-setter, the trainer, the sight-checker, the gun captain, the first, second, and third loaders, and the hot-shell man. As in the case of the 40-millimeter, pointer and trainer sit on iron saddles respectively on the left and right sides of the guns. On the gun platform and directly behind the pointer's shoulder stands the sight-setter who, as Crew 21 learns, is the most important man in this nine-man outfit. He must be possessed of an almost uncanny ability to be fast and accurate, no matter what is going on around him. If the sight-setter does not have both of those characteristics at all times under all conditions, he is useless to the gun crew. Receiving his orders from the sight-checker, known also as the

local fire-control man, his work must be errorless, or the round of fire is wasted; it must be speedy, for delay or hesitation might prove fatal.

At the shoulder of the trainer, who sits on the right side of the gun, stands this sight-checker, or local fire-control man, whose importance in the scheme of things aboard a 3-incher is no whit less than that of the sight-setter. Together, they are responsible for the accurate aiming of the piece. Again comparable to the 40-millimeter, pointer and trainer each manipulate control wheels which, respectively, elevate or depress the barrel, and revolve the gun, which can be turned more than 180 degrees. Directly in front of each of these two members of the gun crew, and on a level with their eyes, are two sets of sighting instruments called "iron sights" and the "telescope field."

The pointer picks up the target in the iron sights, then drops his eyes to the telescope field and elevates or depresses the gun by his wheel control until the cross-hair lines in the telescope sight bear on the upper right-hand corner of the target. Instantly the trainer, who has followed this action through his own sights, swings the gun to right or left with his control wheel until the two sets of cross hairs in his telescope sight coincide with each other. Meanwhile, sight-setter and sight-checker have their eyes glued to their respective instruments to assure co-ordination.

All this doubtless sounds exceedingly complex and confusing to one whose mind and hands are untrained in the intricacies of gunnery. However, with a thoroughly trained team, the three-inch gun is capable of very accurate—and rapid—firing, as the three loaders and the hot-shell man soon find out in practice.

The magazine holds one shell at a time, but like the famous French .75 in the hands of American gun crews in the last war, the action is so fast that it appears the breech is almost perpetually open. Normally, three loaders are all that are needed to pass the ammunition, but should the supply of shells be too

far away from the gun for three men to serve expeditiously, more loaders will be called on. Crew 21 learns that there are times when as many as 15 or 20 loaders are required.

The hot-shell man is exactly what his peculiar cognomen indicates. It is his business to catch the empties as they are automatically ejected from the gun during the recoil and to toss them into a large chest or container. This prevents the deck from being littered with empty cases which cause falls or other accidents, and conserves valuable wartime metal, provided only that it is possible to transport the metal to a suitable base for shipping. Sometimes, of course, such action isn't feasible. The hot-shell man, however, is one of the busiest and most active members of the gun crew. Because the empty cases, at the moment of ejection, are actually hot enough to cause severe burns when handled with bare hands, the hot-shell man is provided with a huge pair of asbestos gloves. As an expert catcher on a baseball team becomes adept in snaring foul tips off the bat, so does the hot-shell man acquire a technique of grabbing the empties as they fly from the gun, and then tossing them over his shoulder into the box.

Compared to the huge 16-inch cannon mounted on our battlewagons, the three-inch doesn't loom very large; nevertheless it is one of the fightingest guns the Navy possesses. By the same token, the little .20-millimeter Oerlikon machine gun, of which a Destroyer Escort boasts many, spits out a lot of nasty medicine every minute it is in combat. This fully automatic machine gun is capable of firing over 400 shots every 60 seconds, and when a bevy of "20-mills" turns its combined firepower in the direction of a diving enemy plane or the hull and conning tower of a surfaced sub, the rain of lead that results is sufficient to create unmitigated havoc.

There is something a little more individualistic, a little more



A PC-boat is a fast-riding, hard-hitting U.S. Navy vessel, similar to Britain's corvettes.

personal, about the manipulation of these Oerlikon guns that endears them to the hearts of their three-man crews, composed of the gunner, the loader, and the trunnion man, each of whom, by the way, is trained to be interchangeable as to positions on the gun. Understandably, the gunner is the man who pulls the trigger that sends a stream of quarter-pound bullets, some of which are tracers, screaming toward the target. The loader must see to it that the cylindrical containers which hold the shells are forever ready for instant installation, and that the empty cases are quickly removed.

The trunnion man is the one member of the crew who never can see what is going on in the battle of the skies or on the sea. It is an inviolable rule that the trunnion man must stand with his back to the metal shield fastened to the front of the gun and keep his eyes unwaveringly on the gunner's knees. No matter how hot the fight, no matter how machine gun bullets may spray around, he crouches behind his protective metal shield at the left of the gun and glues his eyes to those knees. When they begin to bend, the trunnion man turns his control wheel like crazy. This raises or lowers the trunnion or lubricated sleeve, which slides up and down in the pedestal of the gun, and thereby offers the gunner greater elevation for targets that are directly overhead.

As the gunner pulls down on the "handle-bars" of the gun, he elevates the muzzle, and in so doing he quite naturally scrooches down and bends his knees. This is the signal for the trunnion man to turn his control wheel with all possible speed in order that the trunnion will slide up through the pedestal, thus raising the mount of the gun and enabling the gunner to attain an almost perpendicular sighting on the overhead target. Conversely, when the trunnion man observes the gunner begin to straighten out his legs, it is time to reverse the control wheel and lower the sleeve into the pedestal. As in the case of men

assigned to the other arms, trunnion man and gunner must work together very closely.

Aboard ship, it is the business of the Gunner's Mates to know just about all there is to know concerning every form of weapon habitually maintained on the vessel. To this end, members of Crew 21 who will serve in this capacity spend 21 days in intensive training in disassembly and assembly of many kinds of firearms. They learn about ammunition and the safety precautions necessary in its use, storage, and handling. They study pyrotechnics, their maintenance, care, and application. Gunner's Mates aboard DE-ships must be completely familiar with the nomenclature, operation, and assembly of the following imposing array of sub-busting weapons: the Thompson sub-machine gun, the .45-caliber pistol, the .30-caliber rifle, the .50-caliber and 20-millimeter machine guns, the 40-millimeter Bofors, the 1.1-caliber "Chicago Piano," and the three-inch .50-caliber cannon. In addition, they are required to know the construction, operation, assembly and disassembly of depth charges, their storage and discharge racks, the Y-gun and the K-gun.

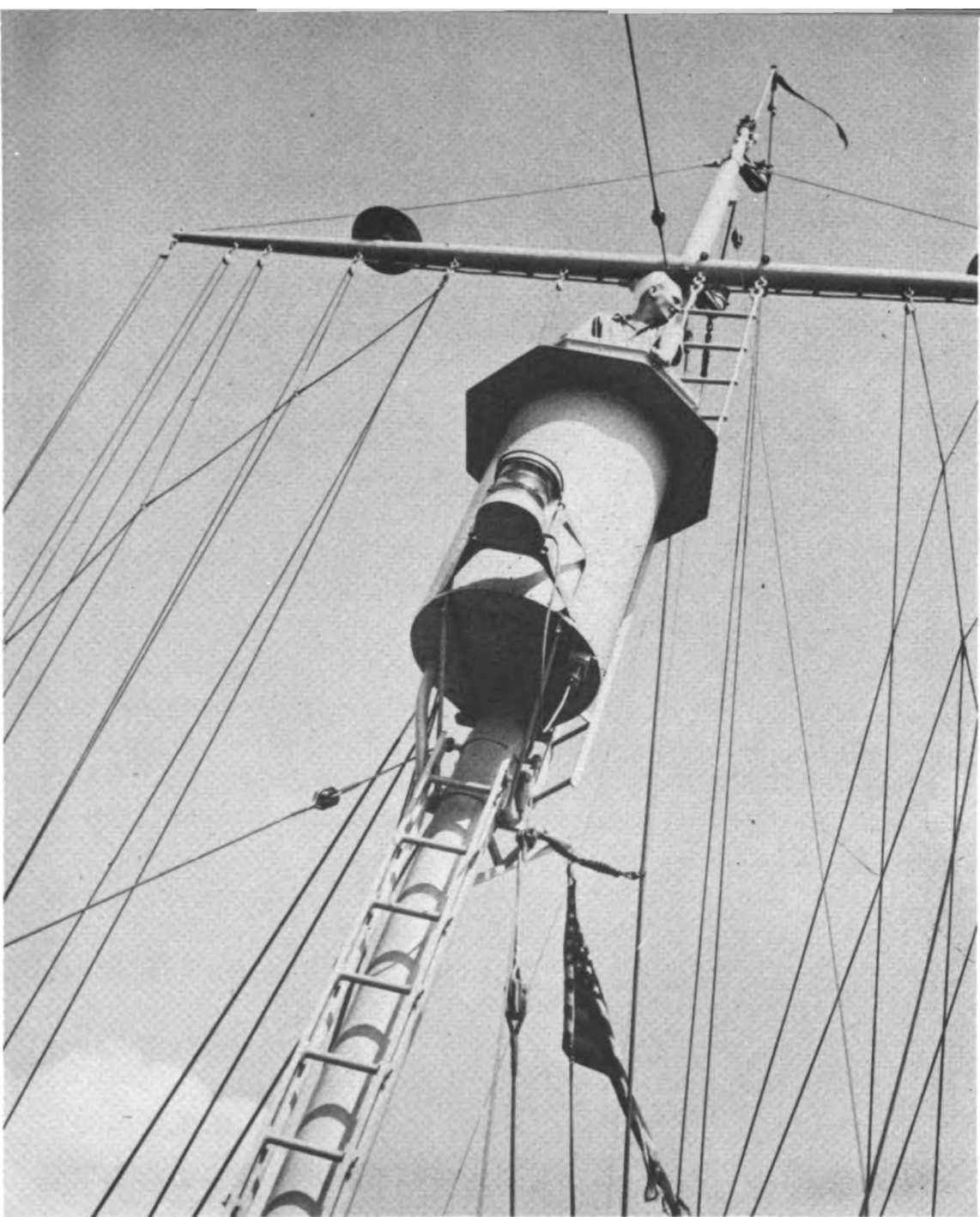
Despite this highly specialized knowledge on the part of the Gunner's Mates, and notwithstanding that part of their ship-board duties during combat are to be a part of the crews of the larger guns with eagle eyes out for instances of jammed shells, overheated barrels, or other casualties to the weapons, there just cannot be a Gunner's Mate for every gun aboard a DE. That means that the crews of all guns must have some basic training in taking down and putting together the weapons with which they fight. This is particularly true of the 20-millimeter Oerlikons. If a gun goes wrong in some respect, a good crew can tell in a moment what is the matter, but if they are not so trained, it might take a quarter of an hour or so, and a delay like that under fire may very well be fatal.

There is another bit of technique that gunner, trunnion man,

and loader must learn in operation of the "20-mill." It is not at all a simple matter to maintain a steady fire when the ship is rolling and heaving, particularly if one is caught off balance. These men are therefore taught not to lift their feet while moving about the gun in a rough sea. They slip or slide them—particularly the gunner, as he swings his mount around to follow a target—so that an unexpected heave of the vessel will not catch them unawares and throw them heavily to the deck, or even overside into the ocean.

Out on the firing range at Dam Neck the lads of Crew 21 who will man the Oerlikons of a DE, like their shipmates on the "40-mill" and the "three-inchers," get their first taste of firing the machine guns at moving targets. Each of the three men who will comprise a crew takes a turn at each of the three positions. They, too, are inclined to nervousness until the call comes to step up to the gun and try their skill. There are many things to remember—how to take your stance, how to strap yourself in, how to rest your left hand so that the first two fingers lie near, but not on, the trigger, until the order comes to fire; how to grasp, with the right hand, the handle which helps to aim the gun, and many, many other things.

There is something snug and friendly, however, about being strapped in, or strapping oneself into, the harness of the "20-mill." Perhaps it's something like that mysterious quality which expert marksmen define as "the feel" of a beautifully balanced shotgun or rifle. The gun seems to lose all semblance of an inanimate, impersonal thing of metal, and becomes a part of your body. Where you turn, the gun turns; when you look up at the target, the long, thin muzzle obediently follows your gaze and almost automatically points itself. In the latter operation, the trunnion man can help materially, but all in all, you instantly derive a sensation that this gun will do just about what you



The Crow's Nest of a PC is an eerie perch.

want it to do, that it will obey your every wish, and that you can hardly fail to come in on the target in a satisfactory manner.

Naturally, with new men it doesn't always work out that way, for above all, the gunner must remember to lead any moving target, and that is one reason why the first shell out of the gun, and subsequently many others, are tracers. Being a tracer, the first shell gives a line on the target, as well as where you are actually pointing, and as there are no sights—not even so much as the bead that customarily is found on the business end of a shotgun—you must watch the direction of the tracers and swing the gun accordingly.

You're strapped snugly in the harness, both hands are in position for instant operation, the plane is now about overhead with the sleeve dragging out far behind. The loader has seated a "can" of shells over the breech, and trunnion man has glued his eyes to your knees and has his back pressed against the shield. All set and ready for the command—"Fire!"

Down come the two left-hand fingers to the trigger, up goes the barrel, and there's a bit of a two-fingered pressure. "Brrrrp—brrp!" and you watch the tracers as they arc out into the sky toward the sleeve. "More lead!" yells the Chief Petty Officer at your elbow. The din of all the "20-mills" is pretty terrific and he has to shout at the top of his lungs to be heard. The sleeve is moving rather faster than you thought, so you begin to scrooch down and bend your knees. Obediently, the trunnion man cranks his control wheel and the gun is raised enough to enable you to assume a more comfortable shooting position. You swing the barrel farther ahead and give it another burst. This time you and everyone else can see that the tracers are meeting the target almost head-on—that's the way it should be, but a bit more lead would be still better.

You move the muzzle, scrooch some more, trunnion man goes to work, and—"Brrrrp—brrp—brrrrrrrrppppppp—brrp!"

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"Nice shooting!" yells the C.P.O. into your ear, and you can see for yourself that, had that sleeve been a German or Jap plane, you couldn't have missed. The tracers showed that the bullets were cutting a path through the air directly in front of the plane's—or sleeve's—course, and by holding the muzzle right there you would make it necessary for the aviator to fly head-on into that deadly stream. Before the "Cease firing!" order comes you have one more chance to swing on the target and get in a final accurate burst, and as you ease off the trigger and unstrap yourself, you find you've been tense and stiff. That will pass with more experience, and the day will come when firing the Oerlikon will be just like shooting cottontails back on the farm.

Yes, the Dam Neck firing range is an important and vibrantly interesting chapter in the lives of future DE-men and other fighters of the Navy. The lessons they learn there are many. They become accustomed to the rattle and roar and boom of gunfire, they lose any stagefright or other nervousness they may have had regarding the mere shooting of firearms, they quickly acquire a confidence in their ability to make these several engines of war talk in the only language that will be understood by the Nazis and the Japs. Once aboard their own ship, there will be not only the "dry-shooting" practice in which they perfect the teamwork so necessary and vital to good shooting, but also there will be rehearsals with live ammunition for the real thing. And when the real thing does come their way, we may be sure the men aboard the DE's will know what to do and how to do it.

THE ASHCAN: U-BOAT KILLER

THE DEPTH CHARGE, AS IT is generally known today, came into being during World War One. England first used it in July, 1915, but it was not until May of 1917, when the German submarine, *U-49*, limped home with a badly frightened crew and their stories of the new "Wasser bombe" which had split the U-boat's seams, broken pipe connections and light-bulb filaments, that its real effectiveness became known. Oddly enough, however, the first recorded instance of a "depth bomb" as a subterranean device for sinking ships occurred in 1776, during our own Revolutionary war against England, and still more strange, that first primitive instrument of underwater destruction was designed to be set in place and detonated by an equally primitive submarine, the type of ship for which the depth charge ultimately was to become Nemesis.

While some may prefer to term the 1776 invention of David Bushnell a forerunner of the modern torpedo, that early instrument did not resemble a torpedo in any sense. It took the form of a 150-pound canister of gunpowder, equipped with a time fuze. It was Bushnell's idea to find a method to attach these things to the bottoms of British men-of-war, and to accomplish that, he built his submarine, called the *Turtle*. This was an unwieldy craft of oak planks somewhat resembling an up-ended egg. The one-man crew stood inside and propelled the craft at the magnificent speed of about one mile an hour by means of a



On PC-boats, too, men learn gunnery the practical way.

Training ships of the "Splinter Fleet" at PC-school are kept clean.



crude corkscrew-like affair, which he turned by a crank with one hand while he steered with the other. The canister of gunpowder was attached to a latch on the outside and fastened by a rope to an auger bit which protruded vertically from the top of the *Turtle*, and which was connected to another crank inside the ship.

Lead ballast kept the *Turtle* upright and a combination of valve and hand pump admitted and ejected water for submersion and surfacing. There was no way to replenish the air supply, but the inventor found he could remain submerged for half an hour before the oxygen was exhausted to a dangerous point. The idea of the contrivance was to steal quietly up to the hull of the enemy ship under cover of darkness, submerge, set the "depth charge," and get away before the explosion took place. The *Turtle* actually went into action in the Hudson River one dark night in sole command of a soldier named Lee. His intended victim was the British frigate, the *Eagle*, moored near the Battery.

The time fuze was set, Lee cranked the *Turtle* at its tortoise-like speed out into the blackness of the harbor, made contact with the frigate, and began to manipulate the auger bit. Nearly a half hour passed before he discovered that the hull was sheathed with copper and that his bit wouldn't penetrate the metal. Realizing that time was short, he released his "depth charge" and got away from there as fast as he could crank. The canister of gunpowder blew up and frightened the British seamen nearly out of their wits. Lee returned safely to the shore and later tried the stunt a few more times, but never was successful.

It is as far a cry from the *Turtle* to modern submarines as it is from the gunpowder canister to the depth charge of today. A relatively simple weapon, the depth charge resembles an oil drum or ashcan, whence it has derived its popular Navy

name. Although there are several sizes, the most universally used type, both in the last war and in this one, has a gross weight of some 420 pounds. It is fitted with a hydrostatic trigger which is set off by the pressure of the water, and as the pressure varies according to the depth, the explosion of the "ashcan" may be predetermined to a nicety for almost any desired distance below the surface. Usually, a number of depth charges are released more or less simultaneously in the area in which the U-boat is suspected to be, and they are set to explode at varying depths to insure "a hit" in so far as is possible.

As the "ashcan" is the most effective weapon against a submerged submarine thus far discovered, it is natural that all ships engaged in sub-busting service are literally loaded to the guards with them. Just how many are included in a DE's complement of weapons is not publishable information, but there are plenty, and as they constitute such a major portion of sub-busting offensive warfare, Crew 21 receives a thorough drilling in their care, handling, and use.

In one corner of that big building known as A-Prime, at N.O.B., is the depth charge classroom where Chief Petty Officer Henry is explaining the subject of "ashcans" to some Crew 21'ers. Let's stand by and listen in.

"It's going to be rough and tough out there, men," says Mr. Henry. "There's only a few of you on that DE-ship, and a helluva lot of gear to handle. Sixty-five percent of it is hard, mean work. Your bow is down—your stern is up—the decks are awash—and it's your job to get those ashcans overboard where they will do us the most good and the Germans the most harm. When General Quarters is sounded, it is up to you to get to your battle stations just as fast as you can—in a matter of seconds, not minutes—and you men who will serve as loading crews never worked faster in your lives than you will when your ship is in action."

Chief Petty Officer Henry is so obviously a sincere man, one

who so evidently knows his subject and what he is talking about, that there is no question of lack of attention on the part of his listeners. Then, too, these lads don't have to be told that the primary objective in their lives for the duration of the war is to sink submarines, and that the best weapon at their disposal for accomplishing this is the "ashcan." They are all ears as the instructor explains the operations involved in firing depth charges from the several types of discharging apparatus.

"The Y-gun," continues Mr. Henry, "got its name because it looks like a huge Y, standing on the deck, usually the after deck, of the ship. Each of the two prongs of the Y are hollow cylinders into which we place the discharging elements for throwing ashcans. Both prongs can be fired at once, or either one can be set off individually. The ashcans are thrown out of the Y-gun by means of what are known as arbors or pistons which, themselves, contain varying amounts of explosives. These are called impulse charges. The heavier the impulse charge, the farther it will throw the ashcan.

"To load a Y-gun, you first set the impulse charge for the distance you want, from 50 yards up, depending on how far away the submarine is believed to be. Then you slide the arbor, which has been thoroughly greased, down into one arm of the Y-gun. Those arbors weigh 60 pounds, so that's one of those rough and tough jobs I was telling you about. Next, with a crane, you swing an ashcan up and onto the arbor, which has a concave, or curved, top surface built to fit pretty snugly around the rounded side of the depth charge."

As he talks, Mr. Henry walks over to a Y-gun that has been set up in the classroom and points out the features he is discussing. Calling on two of the boys, he has them pick up one of the arbors, unloaded, of course, and slide it into the Y-gun's right-hand cavity. Next they lash the chains of a small but powerful crane around an "ashcan" filled with sand, and by



A depth charge addressed to Adolf.

cranking the windlass, they raise it from the storage place and swing it over the concave section of the arbor. Carefully it is lowered into place and fastened there by two lengths of chain with which every arbor is equipped. The lads, somewhat winded, resume their seats and Mr. Henry continues.

"You fellows think that was hard work. Wait 'til you get out there where the deck slants in every direction at once, when the seas are running over, and the deck is slippery. Then you'll find out what tough work it really is. Now then, we've got our arbor in place and our ashcan lashed to it. Next, we must set the depth charge to go off at a certain distance below the surface, and that is done by this adjustment here on the end. We've already fixed the impulse charge, so now we move this dial—can you all see it?—to this mark, and when the can gets down to the desired level and not before, the pressure of the water is such that it will motivate the trigger and explode the TNT.

"Now we insert the detonator. No ashcan can explode without a detonator, so don't forget to put one in before you dump the can, or you'll waste valuable TNT and probably, because you've also lost even more valuable time, you'll lose your chance to get that U-boat. But for safety reasons we don't keep the detonators in the cans when they are stored aboard ship. The detonator is charged with fulminate of mercury, just like the little percussion caps in the center of the back end of a shotgun shell. When the shotgun trigger hits the percussion cap, the fulminate of mercury is ignited, and that explodes the powder in the shell, which in turn blows the bullets out of the barrel.

"Now fulminate of mercury is dangerous stuff. It is very sensitive and must be handled with extreme care. There was a fellow who dropped a detonator once. That's the only one he ever dropped. The detonator is placed in this hole and turned, like this. That locks it in place. When the pressure of the water motivates the trigger, the same thing happens that hap-

pened in that shotgun. The trigger ignites the fulminate of mercury, and that in turn goes to work on a special little can inside this big ashcan. It is called the booster charge of the depth charge, and because of its extreme sensitiveness, it assures that the entire load will let go, and all at once."

One lad raised his hand to ask what becomes of the arbor when the impulse charge is set off and the instructor replies that arbor and "ashcan," still lashed together with the chains, describe a huge arc through the air, and fall into the ocean at about the required distance. Mr. Henry pictures a flying ashcan as a huge potato masher, with the arbor resembling the handle and the depth charge the part "you pound potatoes with." One arbor is needed for each depth charge fired from either a Y-gun or a K-gun.

"And a K-gun," he continues, "is like a Y-gun in all general respects save that the stanchion looks like a slightly lopsided K and it discharges only one ashcan. They are set on the deck facing either to port or to starboard, and are rapidly replacing the Y-guns on the newer ships. Your new ship will have only K-guns."

The care of the store of depth charges is a matter that receives a good deal of attention, both in classroom and aboard ship. Every ashcan is checked and double checked every day to be sure it is in the proper condition. Arbors, or pistons, are stored all over the ship. They hang from racks along the side of the superstructure, they are stacked in convenient places here, there, and everywhere, for when they are needed, they are needed fast and in quantity. Every one of these must also be regularly examined to see that its chains are not fouled and to be sure that the ever-present coating of grease or cosmoline is sufficient to ward off corrosion from the salt air.

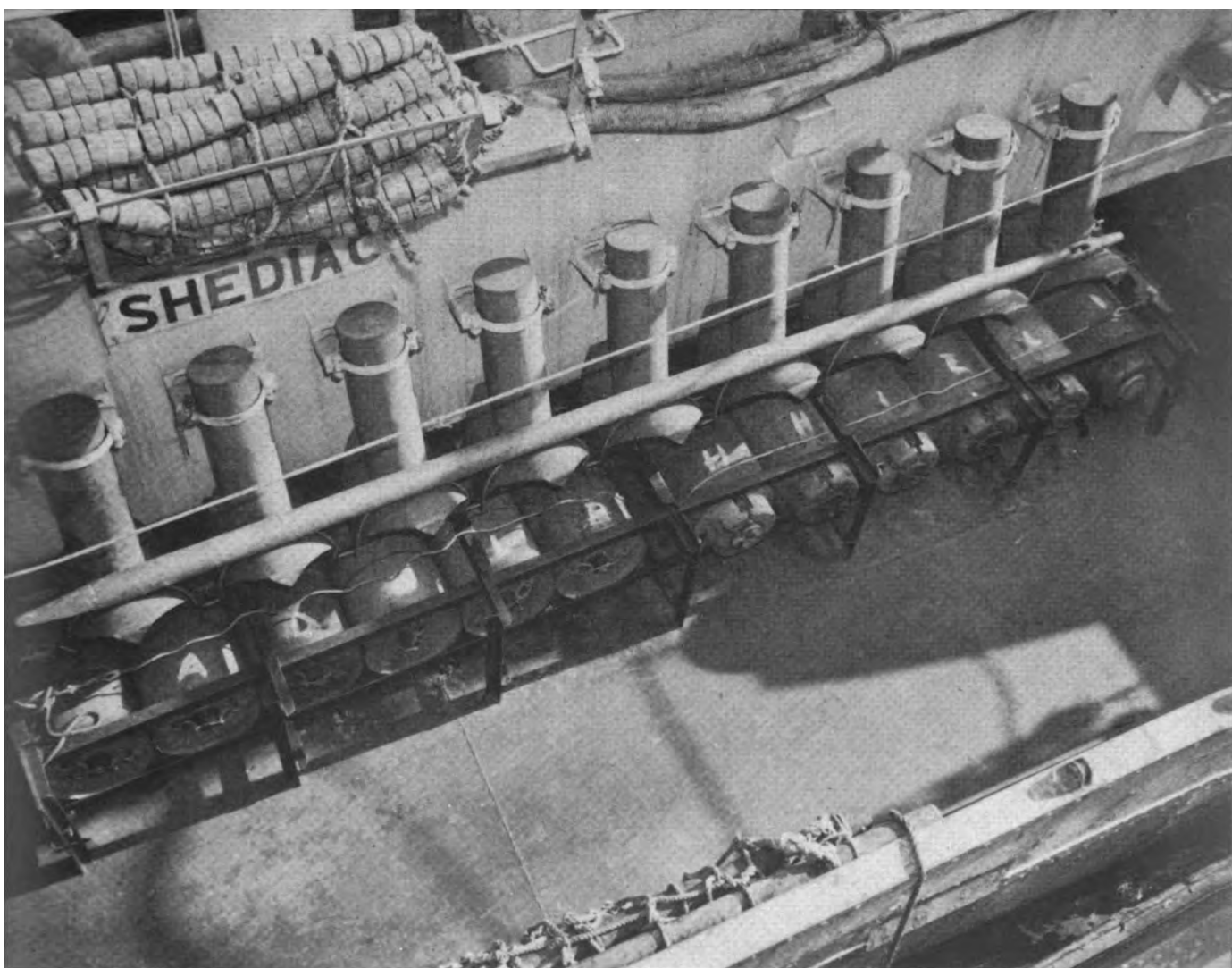
To describe more clearly the tactical use of depth charges, the instructor explains that "dropping a pattern" is far more

important today than in 1917. In those days the hulls of German submarines were not as stoutly built as they are today, and the 300-pound ashcans were believed to cause serious damage, if not complete wreckage, if they exploded as far away as 40 yards. If the hull of a U-boat is constructed to withstand the ocean's pressure 300 feet beneath the surface, and if the additional pressure brought to bear by the explosion of the depth charge is sufficient to exceed the safety factor of the hull submerged at 300 feet, then the U-boat will likely be damaged.

"Actually," explains Mr. Henry, "they've been experimenting for years to find out what structural damage an ashcan does to a sub, but as yet there's no real answer. We do know that if we get our ashcans close enough, we'll blow 'em out of the water, but the trick is to get 'em close enough.

"Today's German U-boat fleet," continues the instructor, "consists of a majority of vessels of 740 tons, together with a number of 250-tonners—for inshore duty within a radius of 1200 miles—and a considerable sprinkling of medium-sized ships of 512 tons. The 740-ton sub is about 220 feet long, over-all. It has a 20-foot beam, and probably carries food and supplies for two months for a crew of 45. It has a cruising range of 14,000 sea miles, an ordinary surface speed of 17½ knots, and can be pushed to make 20 knots or more, which is fast enough to overtake the fastest moving convoy, but not speedy enough to run away from your DE-ship.

"This sub crash-dives in less than a minute, and can safely submerge to a depth of 600 feet. The hulls of these U-boats consist of an inner and an outer shell, and the compartment in between is filled with oil. That packing helps ward off the force of the ashcan explosion and is another reason why we have to get 'em in as close as possible. Also, that oil compartment has been the cause of some false reports on sinkings. If the outer shell is cracked or split, a stream of oil comes out

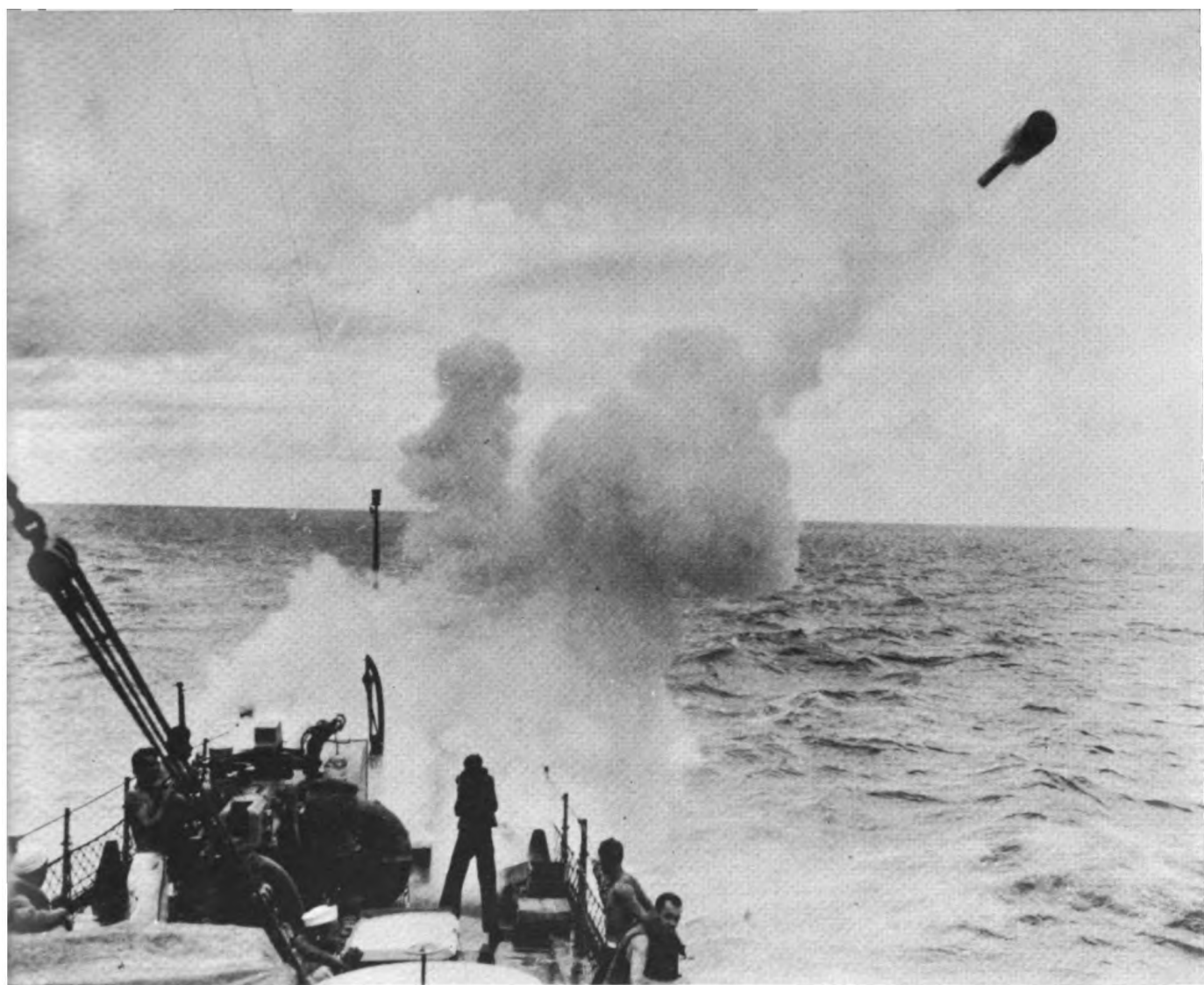


Line-up of depth charges aboard a corvette.

and up to the surface, but the inner shell may still be intact and serviceable."

Crew 21 learns that not only will they operate the K-guns instead of Y-guns on their DE, but also that the ship will be equipped with the depth charge racks on the fantail, or stern, one to port and one to starboard. Here, they find the procedure is somewhat different. There is no impulse charge needed to send the ashcans on their way. The racks are built on an angle so that when restraining pins are removed, the cylindrical cans roll off the rack and fall into the sea. They are told that when this procedure is used, the ship must be traveling at a rate of speed sufficient to take her out of the danger zone, or else the force of the explosion may open up her seams as well as those of the U-boat.

"All right, men," concludes Chief Petty Officer Henry, as class time draws to a close, "you and I are going to have one last session before you get out of N.O.B. and onto your ship, and we'll spend the entire time working with these various devices. But never forget—I've warned you that rough and tough times are waiting for you out there. I know you can take it, and you know it, too. And remember, also, that German U-boats are not easy to get. An oil slick doesn't mean a thing any more, because of those double hulls, and they've many another trick up their sleeves to fool you into thinking their ship has been smashed. It's almost down to the point these days where the Navy won't believe you sank a sub unless you bring back the U-boat's skipper—or, at least, his cap. That's all."



"Bang!" . . . and away goes an ashcan to hunt for a sub.

“THE EYES OF THE SHIP KEEP
IT AFLOAT”

IN A LIGHT-PROOF ROOM about 30 feet square in Building A-Prime, the Navy teaches Crew 21 and all other prospective DE-men how to become proficient lookouts through proper use of their eyes. Just because a man's eyes were good enough to get him into the Navy is no indication he knows how to use them. More than likely he doesn't. He probably never knew, for example, that in order to see an object in the dark, he should not stare directly at it. Instead, he should look just above the object, or turn his head slightly and peer from the corners of his eyes.

The usual tests of sharpness of vision given as part of the Navy entrance examinations are not sufficient for the selection of men for night lookout duty. An entirely different set of vision cells are utilized in night vision from the cone cells called upon to function in day vision. With some people, the daylight cells may be perfect, whereas the night vision cells may be defective. The center of the eye, which is best for day vision, is useless and blind at night, because what are known as the rod cells, which are located around the outside of the retina of the eye and which are lacking in the eye's center, are the ones used in after-dark seeing.

In the Lookout Training Room at N.O.B., as well as at other Navy training stations, men learn the meaning of “dark-adaptation.” They learn the tricks of the night lookout and discover that not everyone has the optical ability to spot ships in the dark-



Beards are popular with the men at sea.

ness and to identify them. How vital the eyes of the escort vessels are to the safety of themselves and the convoy is brought home by the instructor's statement that in this, as well as in past wars, ships have been lost not through the carelessness of the lookout, but because his eyes had not been "dark-accustomed," or because of some physical disability over which he had no control.

Realizing all this, and because our improved sea defense and offense made it unhealthy for submarines to attack convoys in daylight, the German High Command adopted what its U-boat Admiral Karl Doenitz called the "Rudelsystem," or wolf-pack tactics for night operations. These involve use of a fleet of six or more submarines, with a predetermined rendezvous at sea, although in unprotected waters as few as two U-boats have been known to operate together in parallel lanes. Controlled by the "master wolf," an ace submarine commander, the pack lies in wait just off the convoy trail until the master wolf signals his secret orders as to when, where, and how to strike.

Attacks frequently are made just before dawn when, due to the very confusing light, the visibility of the ship's lookouts is low, and when it is still too dark for effective use of protective aircraft. The pack method of attack may create confusion in the sonic instruments of the convoy and its escort ships, for the guardian sound-detecting devices will report sounds from many directions simultaneously and are less efficient against submarines on the surface than when they are submerged. The whole pack may dive under protecting ships at a given signal to surface somewhere in the middle of the convoy and let fly with torpedoes in all directions at once. The theory is that while one or two subs may be destroyed in this maneuver, the resultant damage to troopships or vessels heavily laden with war supplies will more than offset the loss of the expendable U-boats.

Another attacking maneuver calls for the master wolf to lie quietly on the surface in the night, awaiting the approach of the

convoy. The rest of the pack has also surfaced, some miles away, and will permit the convoy to pass them unharmed. When the lone wolf attacks the head of the convoy, he signals orders to the rest of his command to close in from the rear, and while the master wolf creates as much diversion as possible to draw fire and attention of protecting ships to himself, the pack closes in for the kill.

Still more recently, other Nazi U-boat tactics have been reported. This new strategy is likewise credited to Admiral Doenitz and calls for attacks at convoy assembly points. During the time convoys are gathering their forces for a transoceanic trip the cargo vessels are literally "sitting pigeons," instead of being under way at sea and having at least the advantage of their relatively slow speed. It has been said that these assaults may be expected at widely separated points, such as off the coasts of Canada, Brazil, Africa, and so on, by large numbers of U-boats. In addition, it recently has been reported that the newly developed auxiliary aircraft carriers are to receive special attention on the part of the Nazi submarine skippers.

When members of Crew 21 enter the Lookout Training Room at N.O.B., they are confronted with four jet black walls and an equally obsidian ceiling. At one side of the room are two tiers of wooden benches to serve as classroom seats. Along the opposite side has been built what is called a "sea panorama." This is a shoulder-high shelf, curved to represent the horizon, and it, too, is as black as the inside of an old stovepipe. Two assistant instructors move about below the shelf, placing miniature wooden ships here and there.

A little in advance of the tiers of seats is a boxlike structure built to simulate a lookout post aboard ship. Two at a time, members of the class will "stand watch" in this make-believe lookout post and endeavor to see through the blackness that will encompass them. They will try to spot the tiny warships,

exact models of enemy vessels built to the size they actually would appear if they were the real things out on the real horizon, five miles from the ship's lookout post. Varying light conditions, none of which could be classified as brilliant, will be produced by the instructor, who sits behind a control box equipped with switches and push-buttons.

When the class has assembled and while the room is still lighted, the instructor explains the importance of practice with and training of the eyes in the methods which have been found to be most productive of good lookouts. He describes the workings of the human optical system in brief and states that no man should report for lookout duty without having taken at least 30 minutes and preferably 45 minutes to make his eyes "dark-adapted." The Navy realizes that sailors aboard fighting ships in wartime have few hours to themselves, and that they might be loath to devote the required time for dark-adaptation by sitting in a closet or blacked-out room before going topsides for watch duty. The men are therefore provided with large, comfortable goggles equipped with special Polaroid lenses. While still in the lighted areas below decks, and prior to going on watch, the men wear the goggles for half to three-quarters of an hour, and thus accustom their eyes to the darkness outside. Best part of it is that with these special goggles they may continue to read, play cards, or engage in other pursuits without hindrance in visibility.

While the instructor is talking, Polaroid-lensed goggles are passed to each member of Crew 21 and they are asked to put them on so that their eyes will become used to the blackness which will ensue when the lights in the room are extinguished. By means of his control switches and buttons, the instructor explains he will produce what he calls the "crack of dawn" along the make-believe horizon. This will be such an infinitesimal display of light that it will require about six minutes for most of the men to begin to sense that it is there at all. A few whose



Fighting ships fight weather as well as the enemy.

eyes are physically better equipped for night vision may see it in about two minutes.

Again the class is warned that if they would see the "crack of dawn" as well as the ships and other objects, such as "islands," "lighthouses," "icebergs," and so on, which will be put in place by the assistants after the room lights have been extinguished, and which will be silhouetted by the faint horizon light, they must *not* look straight at the horizon level, but at a point two or three feet above it. They must get *off* the object in order to see it. Experiments in laboratories and at sea, continues the instructor, have convinced the Navy this method is far superior to staring directly at something in an effort to identify it.

With the lights in the room extinguished, the men are told that the simulated lookout station represents one in the forward part of a vessel, that as they look toward the "sea horizon," they are facing the bow of their ship. When each sailor takes his turn at being lookout, he will be required to call out the approximate location of any object he sees or thinks he sees on the horizon. In giving the bearings of the objects, he is to imagine he is standing in the center of a circle divided into its 360 degrees. Dead ahead is zero and, working clockwise, the position at a 90-degree right angle is termed "zero-nine-zero" (090); directly behind the lookout would be "one-eight-zero" (180), and to his left would be "two-seven-zero" (270). At a point midway between zero and zero-nine-zero, it would be "zero-four-five," while the midway point on the left, or port, side between zero and two-seven-zero is called out as "three-one-five." This is the Navy's method for reporting bearings and is at present used in place of the old call: "Ship sighted 15 points off the starboard (or port) bow."

The room is now darker than the blackest, most moonless night at sea, and the instructor says: "Can anybody see the crack of dawn?" He actually has turned on a minute glow of light

which should appear behind the sea horizon, but as yet no eyes have been able to detect any difference in the Stygian darkness. "Somebody ought to see it—it's been on for four minutes. Remember, don't look at the horizon; look above it."

Finally the best eyes in the room are able to discern an extremely faint glow, but many are still unable to distinguish it. The instructor increases the light ever so little. It is still far less than "the dawn's early light," but it does become visible to most, and one of the lookouts, whose eyes are apparently better than those of his fellows, sings out: "Ship sighted at zero-four-five, sir!"

"Okay. Can you identify the ship?"

"I think it's an airplane carrier, sir. Seems to be sort of flattish."

Just then there is a tiny white flash and the other lookout cries: "Gunfire at zero-five-zero!"

By means of his control buttons, the instructor produces more white flashes which are identified as gunfire. Then there are tiny red glows, which are fires at sea, and all the while the light back of the horizon becomes a little bit stronger, until the silhouettes of the model ships stand out plainly enough for all to see. The process is then repeated with two more men as lookouts, and each time the room lights go out the assistant instructors change the positions of the models so that the sailors learn how to co-ordinate various locations of objects with the corresponding degrees of their imaginary bearing circle. They have also learned that to see something in the darkness, they must not look at it. It is a trick they will have occasion to use many, many times in the tense hours on watch during convoy or combat duty.

Difficult as it is to prepare the eyes thoroughly for a plunge into the utter darkness of a ship's deck at night, the entire preparation can be lost in a fraction of the time it takes to get ready. A sudden flare of a match or a cigarette lighter—in a companion-way or other recess, for they are not permitted on deck after dark

—will undo all the effort spent in dark-adaptation. Even continuous looking at the radium-illuminated dial of a watch will have its detrimental effect. Should brilliant flashes of gunfire be observed far out on the black horizon, lookouts will instantly cover one eye with a hand so as to preserve the adapted condition of one set of optical nerves. If the gunfire is more or less frequent, the eyes should be alternated so that partial adaptation, at least, may be retained.

But night lookout duty is not the only form of visual training DE-men receive. They are instructed in aircraft and ship identification through the use of models and a series of motion picture films. They attend further classes in lookout bearings, and they learn how to use their eyes in the glare of the blinding midday sun.

Several of the movies are in animated drawing form, designed to show the outstanding characteristics of planes and ships. The aircraft identification film terms the system W-E-F-T, which stands for Wings, Engines, Fuselage, Tail, and it succeeds so well in breaking down both enemy and friendly aircraft into these four main brackets that normally one showing of the film, plus a few hours' work with a series of silhouettes on cards, usually serves to place a number of these ships indelibly in the minds of the trainees. In the same manner, the film on ship identification is arranged on the three symbols of M-S-T, which represent the three major characteristics of vessels, Mast, Stacks, Turrets.

When standing watch on a bright day, the reflection of the light from the sea is extremely tiring on the optical nerves. Properly lensed glasses are used to refract the light rays and to keep out those that are particularly harmful. A good lookout, on either day or night watch, will shift his head and eyes from one location to another as he constantly gazes at the horizon. He will seem to do this in a somewhat jerky fashion, rather re-

sembling a chicken when it scans the barnyard. Each jerk covers a small sector of the portion of the horizon the lookout must cover, and as he holds his head in each position for a moment or two, he moves his eyes from side to side to cover only that part of the horizon which is then in his immediate vision. This tends to relax the optical muscles and helps prevent sun-glare.

Millions upon millions of good eyes are needed in wartime to combat the enemy. From the scores of thousands of civilian plane-spotters and the millions of war-plant workers, to the air forces, to the armored divisions, the infantry, and to all other branches of combat and defense services, expert vision is of paramount necessity. Yet nowhere are the optical nerves called upon to resist more of a strain than in standing day or night watch aboard a warship at sea. So very much depends on instantly seeing and identifying objects that it is easy to understand why now, more than ever before, the Navy subscribes to its old adage: “The eyes of the ship are what keep it afloat.”

Chapter Sixteen

THE NAVY'S SMOKE-EATERS

THE CRY OF "FIRE!"—MOST dreaded of all alarms at sea—rang out hysterically above the throb of the engines. Other throats picked it up. It echoed and re-echoed along the decks, through the cabins, upon the bridge. Flames rose swiftly and horribly; pandemonium reigned; and when the ship's list was checked, it was found that 140 persons had lost their lives in the burning of the *Lexington*. That was in January, 1840, off Eaton's Neck, Long Island. Just 102 years later and away over on the other side of the world, in the Coral Sea, another *Lexington* burned as fiercely and as stubbornly as had her wooden-bottomed somewhat stodgy ancestor of an earlier century.

From the days of the Roman fighting galleys to the holocausts of the present war, the fire demon has plagued maritime history. Once that demon rode on silent, fire-tipped arrows; today its vehicle may be bombs, screaming downward in destruction. All through the long transitional centuries from ancient trireme to modern battleship, in peace as well as in war, man has been unable wholly to localize fires at sea and prevent them from becoming disastrous.

In this war, particularly, it has not been the direct torpedo or bomb damage to naval units that has put many ships out of action, but fire—the fierce, uncontrollable burning of large supplies of fuel oil or other highly volatile inflammables. Especially has this been true of our lost airplane carriers which must main-



The skipper inspects the crew on after deck.

tain excessive supplies of high-octane gasoline for their complements of planes, to say nothing of the huge quantities of fuel oil needed for their own engines on long cruises, and the stocks of ammunition and bombs for the planes, as well as quantities of anti-aircraft ammunition for the warship's defensive armament.

Time being of far more than the mere essence in refueling squadrons of planes aboard a carrier, supply lines of gasoline must be carried through the structure of the ship from the storage tanks up to the flight and hangar decks, so winged fighters can receive their gasoline supplies in the fewest possible number of minutes. Thus, the aircraft carrier, although capable of taking unbelievable punishment from enemy shells, bombs, and torpedoes and yet remain functioning, becomes a floating fire hazard that to date has defied the most heroic of fire-fighting efforts.

Down in Norfolk, Virginia, the Navy is seeking the answer to the apparent paradox of "water, water, everywhere"—and still the ships will burn. Five Fire Fighter Schools are now in operation, with the parent school at Norfolk, where the 30 officers and men comprising each of the faculties of the other institutions received training before taking over operation of the units at Boston, Mare Island, Bremerton Navy Yard, and Pearl Harbor.

Classes for the short but intensive courses are recruited from the Damage Control Crews now existent aboard the Navy's ships, and when a vessel is in or near a port where a fire fighters' school exists, the men attend for as long as possible. It will be the one-day lecture and demonstration course, if time is short, or perhaps the one-week curriculum, if men can be spared that long. Crew 21 will get the intensive one-day course.

The student body is made up not only of enlisted men, including DE-men, but of officers as well—ensigns, lieutenants, and

even three-strippers listening attentively, or keenly watching the practical demonstrations. Graduated groups, each known aboard its ship as the Damage Control Party, are not coached merely to stand by and await a fire, but to take on the extra job of specialized smoke-eaters, trained in the practical technique of extinguishing marine conflagrations and of saving lives of shipmates trapped by smoke or flame.

And "practical" is certainly the word for the demonstrations, for they include setting fire to a tank of 200 gallons of oil, rendered additionally volatile by 10 gallons of gasoline, and, after permitting the fire to gain maximum headway, extinguishing it in a matter of five to seven seconds. At N.O.B., for example, are three peculiar-looking structures of concrete and steel, squatting side by side in an open area. Each of these is a replica of a section of a destroyer, looking as though a gigantic knife had sliced down through the top deck to just below the water line. One of the structures represents the fo'c'sle, one the engine room, and the last, the boiler room. The decks, or "topsides," are equipped with hatches, ventilators, fire-hose connections, scuppers, and many other appurtenances found aboard destroyers.

Portholes have been provided in these slices of simulated destroyers as have likewise the ladders leading below, the companionways, and, in the instance of the fo'c'sle, old mattresses and other inflammables have been piled in what would be the berthing spaces to represent comparable combustibles aboard ship. While there are no actual engines or boilers in the respective sections that would normally contain them, the engine room and boiler room are exact duplications as to size, arrangement of hatches and ladders, and the bases for a destroyer's power plant. In other words, when a fire occurs below decks in these make-believe warships, and it is necessary as part of the training routine for fire fighters to go below, the physical conditions



Coming at you! A Motor Torpedo Boat, bow-on, at top speed.

found in practice will approximate as nearly as possible those aboard ship.

Let's go "topsides" of the engine room section and join Crew 21 and other future fire-fighting specialists of Uncle Sam's Navy. It's a good 40 feet straight up the rungs of that iron ladder to the railing around the deck, so take a good breath and hang on tightly. Once up there, we take a position to windward, for otherwise the brisk breeze would blow the smoke and water in our direction, and we're not garbed in dungarees, as are the students.

Lieutenant Lloyd M. Johnson, USNR, officer in charge of the Norfolk school, takes over and explains the methods of fire extinguishing and the paraphernalia with which they are applied. The Lieutenant has seen plenty of marine fires in his day, for he spent 16 active years as a member of the Marine Division of the Boston Fire Department, while his assistants, Lieutenant Edward Gaughan and Lieutenant (jg) Joseph F. Kilduff, both USNR, are Boston "smoke-eaters" in their own right.

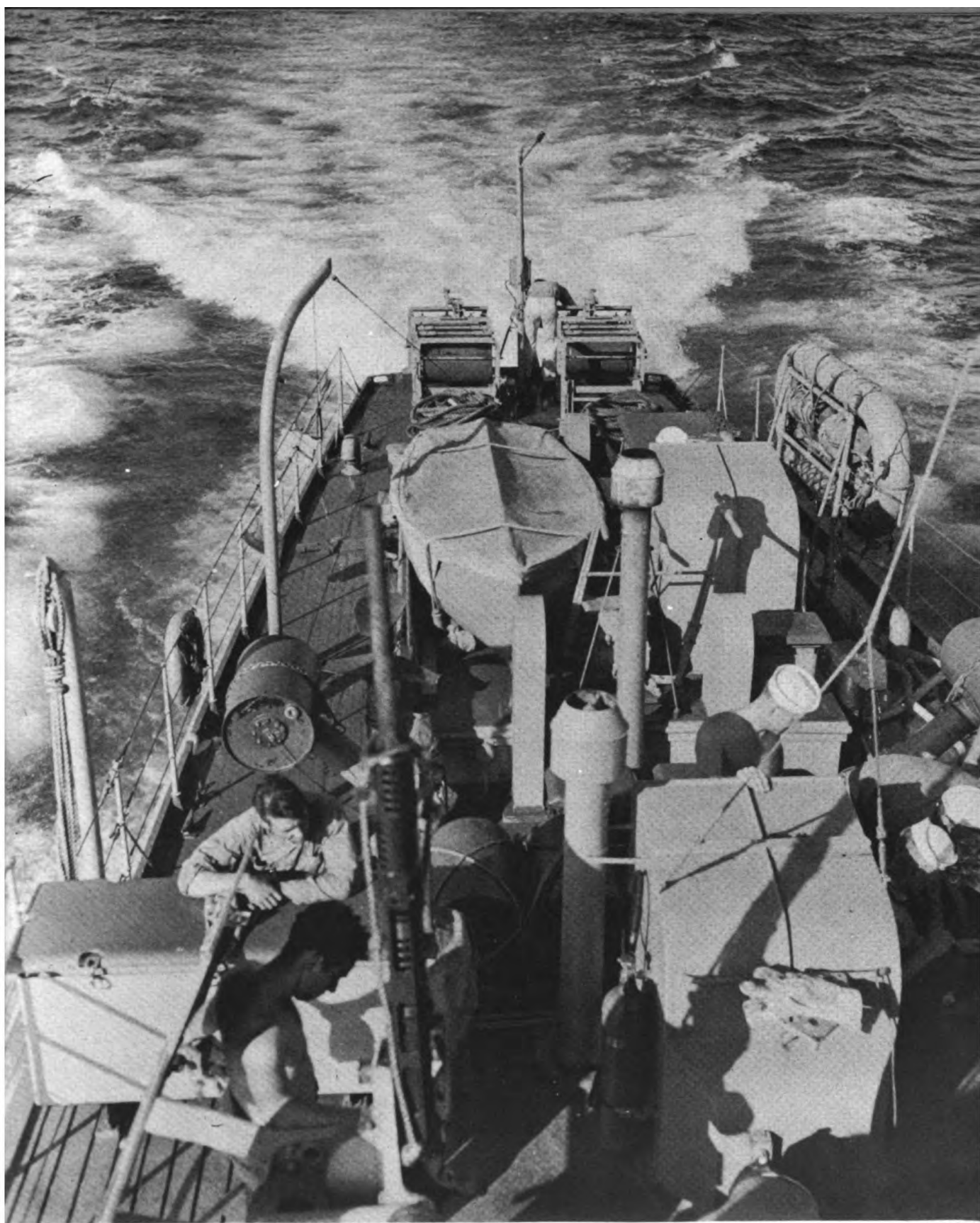
Lieutenant Johnson explains that nowadays oil fires are fought with water—a practice once considered to be extremely dangerous—as well as with carbon dioxide gas and dry and liquid foam. True, the water cure for gasoline or oil fire does not consist of a solid stream of water, such as might be poured into a blazing building on land. For such conflagrations the H_2O is translated into either steam or "waterfog," both of which have the effect of smothering a blaze of volatile liquids. The CO_2 and the foam are extremely efficacious so far as fires aboard our fighting ships are concerned, but both substances needed for this type of fire fighting come in containers and it is possible that the supply would run out in the case of a serious blaze but, as Lieutenant Johnson phrases it: "There's always water near a ship." For that reason, as well as for the acknowledged efficiency of the methods, both steam and "waterfog" are used extensively and

the methods of application form a major portion of the fire fighters' curriculum. Steam, however, does have certain limitations, for its small penetrating power and excessive heat makes it not so acceptable as an extinguisher in certain types of cargo fires, such as cotton and other similar bulky materials.

Fighting fires with "waterfog" is not new, but the present-day nozzles with which it is applied are, and what they do to water is something we'd all like to do to the Jap Empire. One of these nozzles smashes a gallon of water into millions of particles of fog, making it, for extinguishing value, equivalent to 30 gallons of water. When you consider that 54 gallons of water pass through the high-velocity nozzle tip in a minute, you can readily estimate the amount of "fog" that can be forced over the flaming floor of an oil-soaked engine room.

It's all very simple. When a solid stream of water is directed on a gasoline or oil fire, it has little extinguishing effect, and may serve to scatter the flames. When, however, the nozzle divides the supply of water in the hose into two streams and forces them to impinge one upon the other as they emerge from the same tip, an exceedingly fine spray, or fog, is formed. The fog offers a far greater heat-absorbing area than does the solid stream, and steam results almost instantaneously. The speedy absorption of heat in this manufacture of steam causes the vapors to increase in density. Oxygen, on which the fire feeds, is displaced by the downward motion of the waterfog, the mixture of air and burning vapor becomes too lean for combustion, and the fire goes where all bad fires should go—out.

After this principle has been explained to Crew 21 and the other assembled sailors, Lieutenant Johnson and his assistants select two crews from the members of the class and demonstrate the workings of the nozzle, the hose, and the valves that control the water supply. When a ship goes into battle, the fire hoses are not spread out on the decks in anticipation of a possible fire.



An SC-boat is often a veteran of the last war, a member of the "Splinter Fleet," with plenty of fight left.

That was tried. Machine gun bullets, bomb and shell fragments succeeded in making Swiss cheese out of so much of the hose that it was thereafter left coiled in the most strategic places, but on going into action it is the business of the Damage Control Party to see that all is in working order and to be ready to act fast. Therefore, the practice crews atop the pseudo-engineer room section start from scratch and are timed to the second by a stopwatch.

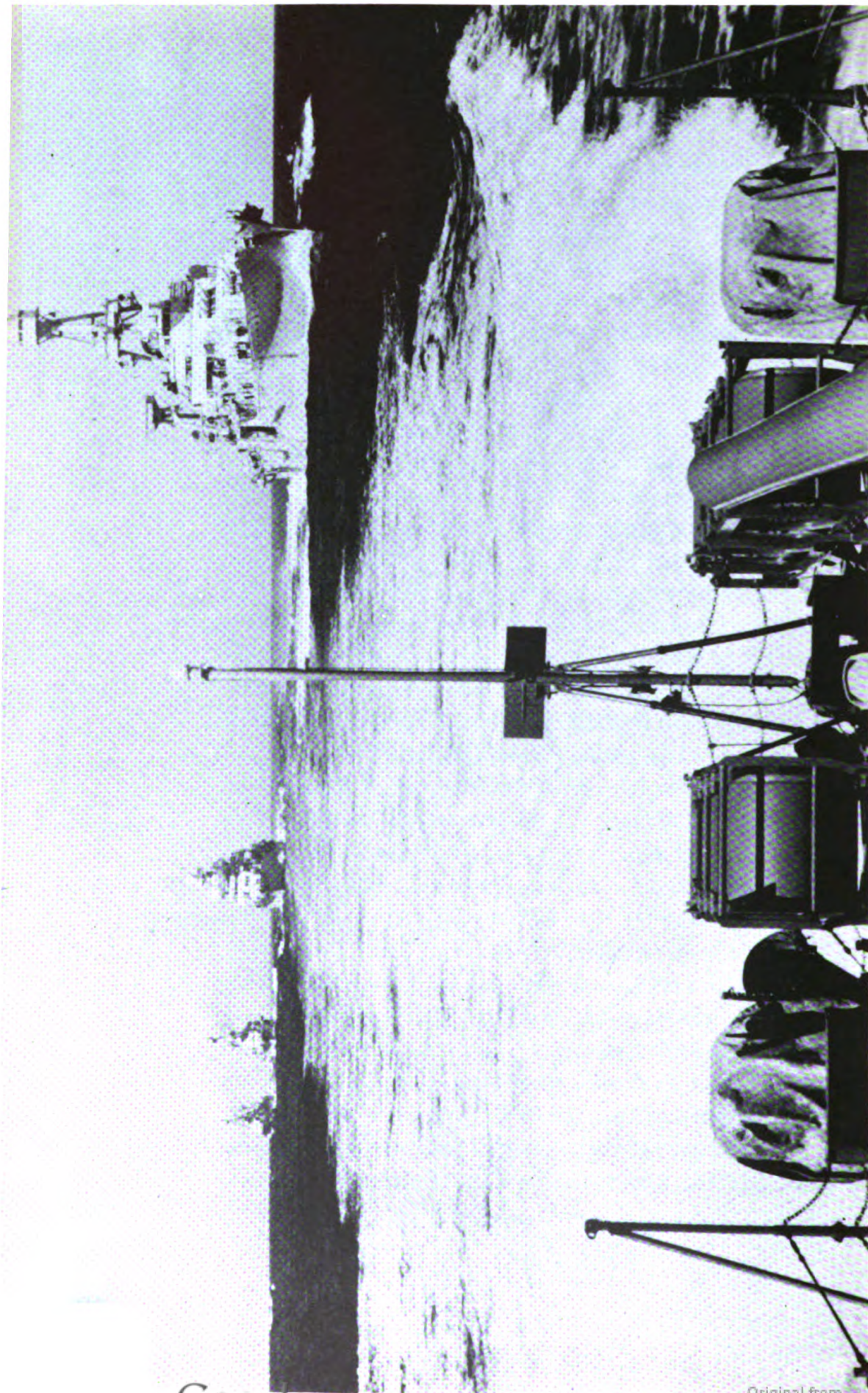
Down below us, in the make-believe engine room, bilges contain 200 gallons of oil, into which has been poured kerosene and gasoline, just to make it tougher. All hatches are closed, and at a signal from the lieutenant that exaggerated Molotov cocktail is ignited. Instantly there is a terrific roar of flames from below decks, black smoke pours from every crack and crevice, the lieutenant's whistle blows, and the neophyte fire fighter crews leap to their stations. The hoses roll out across the deck, the nozzle men are ready to couple on the proper tip—for there are both four- and ten-foot applicators, depending on the location and type of fire—the valve men are alert for the ready signal and, almost before we could cry "Fire!", millions upon millions of infinitesimal fog particles are on the way down through escape hatches to play their part of Nemesis on the flaming hell below.

For the first second or so the bellow of the flames seems even louder and angrier, the billowing smoke appears thicker, the huge hatch covers bounce up and down with a noisy metallic clangor as the heat waves become ever more terrific. Then, almost as suddenly as it began, the fire begins to die down, the smoke is thinned and mixed with brief clouds of steam, and the fire is out, out in a matter of seconds. It seems miraculous and, of course, not all fires give up so easily. Sometimes they're extremely stubborn, like the one that broke out on a damaged tanker, laid up for salvage operations near Norfolk. With an opportunity to put into reality what they had been learning,

members of the school attacked the fire and fought it with foam as well as with fog for an hour and a half before bringing it under control. Sometimes, as a last resort, when a fire breaks out below in an extremely difficult place to get at, three-inch holes are cut in the deck in a pattern which will permit insertion of many nozzles, thereby forming a "water curtain" and isolating the fire from the rest of the ship.

Rescue work, use of inhalators, and proper application of asbestos suits are also a part of the training of a fire fighter. Contrary to popular opinion, the asbestos suit is not a panacea providing safety from fire. It is for emergency use, for getting in and out of a burning section as quickly as possible with the purpose of saving trapped men or of manipulating vital valves. Men clad in asbestos suits become heated very rapidly, and if water is then played on the suits, steam is created and the suit's incumbent is in a fair way to be parboiled. However, equipped with oxygen masks and protected by the asbestos, rescue parties descend after the fire is under control; part of their job often is to make certain the flames will not break out again.

Practice in fighting fires is not limited to those staged in the imitation sections of ships. On the grounds at Norfolk is a 15-foot tank which periodically spews forth enormous clouds of acrid black smoke and raging flames from a seemingly terrifying oil fire. But it doesn't terrify the Navy's smoke-eaters. Armed with the 10-foot applicator on the business end of a fire hose, they approach as closely as possible to the blazing tank, slither the applicator over the rim, and let waterfog or chemical foam perform its flame-devastating work. Then there's a sheet-metal house, some 10 feet square, which has probably taken more punishment from fire than any other structure in that area. Gasoline and oil are sprayed all over its charred insides, piles of oil-soaked rags and refuse are added to enhance the blaze, the flimsy door is shut, and the torch applied. Instantly the hut is an



With "ashcans" at alert, a Splinter Ship clears the track of any lurking submarines for the "Battlewagons."

inferno, out-Dante-ing even that great artist's descriptions of hell. But it's all in the day's work for the foam- and fog-boys, who have the situation under control in jig time.

Back of all this present-day efficiency in fire fighting at sea, however, is a long, long trail, not particularly pretty in retrospect. Strangely, although man's ingenuity developed his sea-going craft from the crude, wooden, oar- and sail-propelled triremes of the Middle Ages to the steel-clad, Diesel, steam, and electrically powered monsters of today, he failed utterly to safeguard the children of his genius from the hazard of fire. Lengthy and woeful is the list of marine disasters both before and after the loss of that first *Lexington*, over 100 years ago. It took the destruction of the steamer *General Slocum*, which burned while going through Hell Gate, East River, New York, in 1904, with the loss of 1021 lives, to sharpen man's perspective to the point where he determined that such things shouldn't happen.

Prior to that Hell Gate holocaust there were quasi-housekeeping rules and regulations for passenger and cargo ships, with the loosely held theory that "everything should be all right," and that if they were, preferential marine insurance rates would be granted. The *Slocum's* casualty list served to tighten up inspections, and the National Fire Protection Association, then but a 10-year-old infant organization "to promote the science and improve the methods of fire protection and prevention . . .", went to work with a vengeance. One immediate result was that the now extinct Steamboat Inspection Service laid down far more stringent regulations governing marine fire hazards, and did its best to see they were lived up to.

Slow and laborious progress in fire protection and prevention was made in the fields of steam-powered vessels—and then came the shipping of fuel oil, which produced new and vexing problems. Promiscuous cargo ships, never constructed for carrying liquids, transported inflammables in any old tank or tub avail-

able with exactly the result that might be expected—a series of bad fires and an upward curve on the marine insurance loss chart. Once again the N.F.P.A. girded its loins, this time aided by the American Petroleum Institute, and governmental assistance was eventually obtained to set up the Bureau of Marine Inspection and Navigation to replace the outmoded and not too efficient Steamboat Inspection Service. Results were soon obvious, but much was still to be desired when the meritorious effects of carbon dioxide gas on fires were given attention by marine fire engineers and underwriters in about 1929. Potentialities of this flame exterminator had hardly been thoroughly explored, however, when the passenger steamer *Morro Castle* burned off the New Jersey coast in 1934.

Said Commander H. L. Vickery, U.S.N., to the National Fire Prevention Association in 1937, relative to fire-resistant ship construction and the lengthy experiments which had by then been conducted aboard the vessel *Nantasket*: “. . . the *Morro Castle* fire focused a great amount of attention on the proper fireproofing of ships. As always happens following a spectacular disaster, the public was greatly aroused and many panaceas were proposed to prevent another such disaster . . . and a Senate investigation was started . . .”

Said *Scientific American* in its April, 1939, issue: “New safety features being incorporated in the *S. S. Ancon*, recently launched will make her and her sister ships, the *Panama* and *Cristobal*, the safest ships in the world . . . the experts conducted a long series of tests on an obsolete vessel, the *S. S. Nantasket* . . . So complete is the attention of experts to safety aboard these ships that, in the words of the committee of experts: ‘the hazard of fire need no longer be a serious menace to the safety of life at sea.’”

Unfortunately, those remarks and conclusions had to do primarily with peacetime fire hazards, and did not take into



"20-mill" gun practice from the Flying Bridge of a Splinter Ship.

Even converted sailing vessels go to sea in all weather to hunt subs.



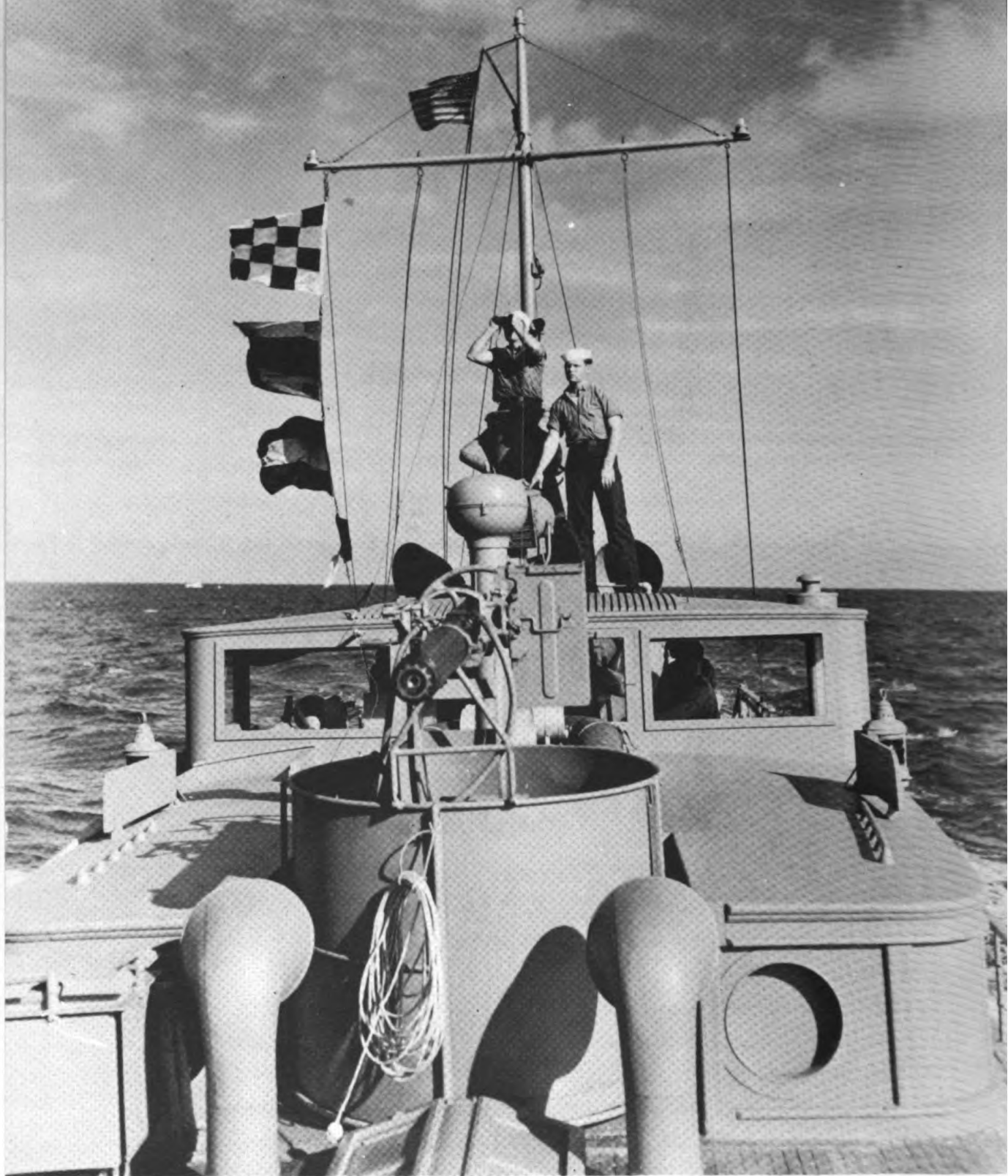
account the bludgeoning dealt out by Jap and Nazi bombs and the resultant conflagrations. Truly, the passenger and cargo vessels of the future will be paragons of preventive fire protection, and life at sea will indeed be safer. Meanwhile, the Navy is literally performing miracles in fire suppression, and doubtless out of it all will come better and more effective measures of combating that age-old menace to maritime travel—fire at sea.

As for Crew 21 and their future DE-ship, they recall the remarks of the venerable Chief Shilson in a Mock-up Ship class and his urgent plea to them to have faith in their ship. They know that every possible precaution was taken in the design and construction of the DE to make her fire-resistant; they know that she is equipped with the latest fire-fighting apparatus; and, after attendance at the Fire Fighters' School and after having taken part in the demonstrations, they know that a fast, smart Damage Control Crew aboard their own ship will give even the meanest of conflagrations a mighty tough fight.

CREW 21 GOES U-BOAT HUNTING

THERE'S NEED OF A watch tonight, a keen-eyed, double watch, for this is no shake-down cruise. That was over and done with a week ago, after Crew 21 had finished its training at N.O.B. This is the real thing. This is it. You're off on the grimmest of grim businesses—hunting Nazi U-boats. The vast ocean expanses are the hunting grounds, and it's open season on enemy ships, planes, and particularly on subs. Every throb of the powerful Diesels drives the ship nearer and nearer to the trouble you are seeking. How will it come? Where and when? Will it be an undersea or an aerial attack? Will it be depth bombs, or a job for the 3-inchers and the "40-mill twin," a booming song of hot lead, with a staccato obbligato by the little "20-mills"?

It's hard to stop thinking when you're on watch, especially at night. Without relaxing vigilance one bit, the mind grinds on and on. It flashes back to the afternoon when Crew 21, fresh from classroom and laboratory, received orders to shove off. Instantly, Building 15 became a maelstrom of bedlam. Everybody yelled and talked at once. Seabags were dumped on bunks and their contents checked against possible clothing needs for the weeks to come. There was a rush for the Head and water buckets to do a last-minute washing job on undershirts, shorts, towels, white hats and other articles of clothing. Requisitions for missing or worn items were hastily scrawled, and one lad, fearful lest the supply of chocolate bars aboard ship would be



Once a pleasure yacht, now a full-fledged member of the Navy's fighting ships.

low, hastened across the street to the ship's store and returned with two huge boxes of the confection.

Matters straightened themselves out eventually, although "Lights Out" that evening was disregarded by many who were still packing seabags. Even the usual laggards rolled out at reveille's first notes the next morning, and after chow there was final inspection of bulging seabags and neatly lashed hammock rolls while Crew 21, in dress blues, stood at natty and rigid attention. A few last orders, then the gear was tossed into waiting trucks, the men climbed into buses, and it was good-bye to N.O.B., and you couldn't honestly say you were sorry to leave. It hadn't been a bad life, but so much more lay ahead—your own new ship, and all that it would come to mean.

And when the buses reached the piers, there she was, a new Destroyer Escort, looking very trig and sturdy in her dress of wartime gray, with guns bristling from her armored superstructure. Struggling up the gangplank under a top-heavy load of gear, there was an unexpected throat tension, and paraphrased lines of Sir Walter Scott came unexpectedly to mind:

"Breathes there sailorman with soul so dead,
Who never to himself hath said,
'This is my own, my fighting craft!'
Whose heart hath ne'er within him burned,
As on the deck his steps he turned
And gazed with pride, both fore and aft."

As is customary on vessels of this general type, crew's quarters are below decks, and you recall it was a pleasant surprise to find that, although about 160 men must be accommodated, the designers of the DE managed to provide a maximum of comfort and room. Three-tiered bunks which fold up flush against the ship's sides, when fo'c'sle or after quarters become temporary mess halls at chow time, are equipped with flat springs and mattresses. It has been said that the below-deck space in which the crew lives when not on watch or duty is more ample than com-

parable accommodations aboard a destroyer. Besides a general stowage space for excess gear, each man has an individual locker. The crew's Heads are well provided with showers, wash bowls, and toilets, and are well ventilated. The galley, with ultra-modern cooking and refrigeration units, with handy and generous storage shelves, with dish-washing paraphernalia, could be the pride of any ship.

There was the usual hustle and bustle that ensues whenever a number of men must get themselves settled, followed by an informal tour topside to see what the rest of the vessel was like. You found a well-fitted-out machine shop adjacent to the armory and engine room. There was a laundry, with tubs, washing and drying machines, clothes pressers, and irons. Sickbay on the DE is replete with first aid supplies and necessities, and even boasts a few bunks for patients.

As had been anticipated, the control and radio rooms, the navigator's office and sound-detecting device room are all Meccas for dials, gauges, indicators, switches, push-buttons, controls, and all manner of intricate mechanisms having to do with running the ship and maintaining its so-important mechanical eyes, ears, and communications. All firepower may be manipulated from the bridge, or the battle can become an individual grudge fight on the part of each gun or depth charge crew through manual operation of each weapon.

The quarters for the Captain, the "Exec," and the rest of the officers consist of small, but complete, rooms, some with upper and lower bunks. The two top-ranking officers have their own toilet and bath, there is a spacious Head for the rest of the officer personnel, a mess room with its own compact and efficient galley, all handy to the bridge. Somewhat similar arrangements care for the Chief Petty Officers, slightly aft of the command's quarters and closer to the main deck. From bow to stern the ship is thoroughly ventilated and air-conditioned, which obviates the



A yawl goes to war. Doughty coastwise sailors in private life help in the business of sub-busting.

necessity for portholes and offers solid steel sides to enemy fire.

All in all, the new Destroyer Escort measured up very well with preconceived ideas of what you would like your ship to be. The veteran Chief Boatswain's Mate remarked, "It's the swellest I've even been on," and he has served aboard battlewagons in his time. Down in the commissary they were still stowing supplies. They already had 3000 pounds of beef aboard, along with 700 pounds of chicken, 650 of veal, 535 of boiled ham, 500 of ground beef, 400 of turkey, 300 of bacon, as well as eggs, milk, fruits, vegetables, and a huge supply of canned commodities. It looked as though the first trip out would be somewhat extensive, but there didn't seem to be any possibility of going hungry.

For several hours the ship continued to resemble a beehive of activity. Those officers and members of the skeleton crew who had been aboard since the fitting-out process were distinctly at home and well settled in quarters. They took charge and brought order, assigned watches and duties, and finally, about dusk, you shoved off. Proceeding slowly down the bay toward the ocean, the last glimpse of N.O.B. consisted of a few dimly twinkling red lights, the warning lights atop masts and taller buildings for the benefit of night-flying airplanes. You passed other ships, darkened like your own DE, save for running lights and the war seemed closer every minute.

Then came chow and minor duties below. At 1915 (7:15 P.M.), all men assigned to the First Watch, from 8 o'clock to midnight, donned their Polaroid-lensed goggles and settled down to get their eyes dark-adapted for the serious business of acting as lookout at sea. By the time the watch went topsides, there wasn't much left of the United States to see; just a faint glow in the sky from the lights of a city. All else is black, very, very black. Not a speck of light shows aboard ship, not even the running lights. Yes, the war is here, now, staring at you, unseen, out of the Stygian blackness. You can't see the war, but it's there,

lurking, waiting, hoping to strike at you when you aren't looking. That's why there's need of a good watch tonight, a keen-eyed, double watch.

The sea isn't running high, just a long, easy ground-swell which the DE takes bow-on in comfortable stride. Comes a spell of real weather and she'll bob around like a loose cork, but she's built to take plenty of punishment and come through topsides up, which is probably more than some of the newest sailors will be able to say during their first taste of a heavy blow. Yes, she's a spanky ship, this new Destroyer Escort. Trim, smart, and agile, she resembles no other craft afloat. Old-time Navy men often blink with surprise when first they set eyes on the "superstructure." Crowning the conventional hull is a construction that looks like a cross between an overgrown submarine conning tower and a gigantic tank turret.

Except for two slit-ports and a couple of portholes, the entire wheelhouse, bridge, and charthouse are encased in protective steel armor. This fortress-like affair and the two stepped-down gun platforms just forward are among the features contributing to the vastly different general appearance, especially when seen from bow-on. Aft of the bridge are the short mast and the squat stack, flanked and followed by odd-shaped bulges, platforms, and crannies which provide additional gun mounts and space for the four torpedo tubes. And then there are the ashcans—scores of them.

Standing bow watch in the blackness of the night, feet spread apart to brace against the light roll and toss of the ship, it's comforting to recall that, for her size, the DE packs a terrific wallop, that she can "take it" as well as "give it." It's good to know that at last Crew 21 is in the war, a part of Uncle Whiskers' sub-busting campaign, and aboard one of his newest sub-busting weapons, the Destroyer Escort. The good, strong words of the elderly naval instructor, Chief Petty Officer Shilson, come to

mind. With that half century of glorious Navy service behind him, he knew what he was talking about when he said: "All ships are dead things of iron and steel, until the crew takes over. There's no such thing as a good ship or a bad ship—good ships come from good crews."

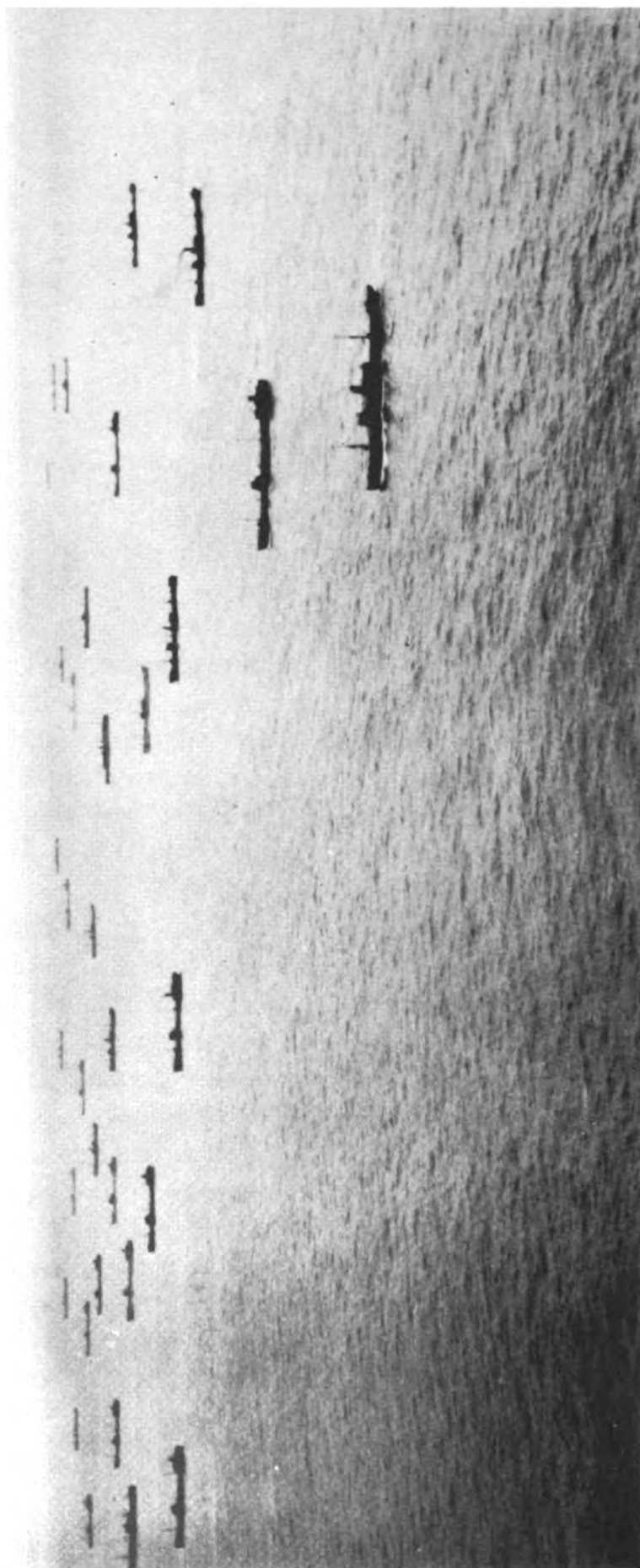
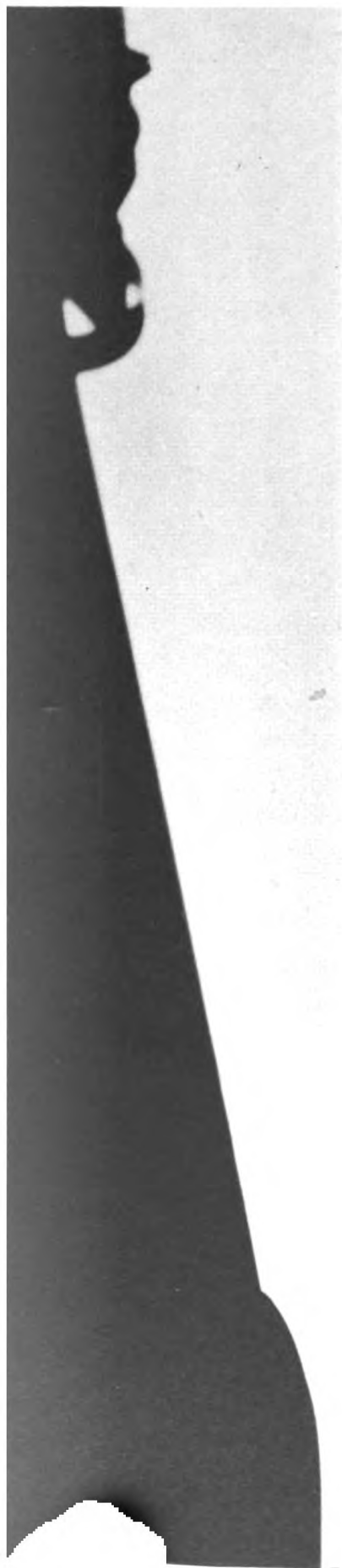
And somehow, with the feel of power surging up from the solid deck plates into the soles of your feet, and permeating on up through your whole system, you know that under Crew 21 and its officers, this particular Destroyer Escort can't be anything else but a "good ship."

AERIAL SUB-BUSTERS

IT MIGHT BE DIFFICULT to find a crew of a seagoing sub-buster that wholeheartedly would agree with the claims toward efficiency made by their fellows-in-arms who man an aerial sub-buster. It's a friendly argument, this discussion about the relative merits of the two so-important arms of the sub-busting service, and one not likely to get out of hand or to interfere with the splendid co-operation each has accorded the other. The sailor may be inclined to think of the Navy flying boat, the land- or carrier-based plane, or the hovering blimp as merely a loftier "Crow's Nest" from which other eyes can see things he can't distinguish from his lower altitude.

The airmen, on the other hand, have their strong points. The relatively slow and ungainly blimp can remain almost stationary in the air, waiting for the U-boat to emerge, much as the patient hunter awaits the appearance of a hidden rabbit. Like the hunter, too, who knows the rabbit is in the hollow log because he saw it go in, the blimp, with a vision from on high, can spot a submarine while that craft is still 30 or 40 feet beneath a calm ocean surface. The sub, of course, cannot see the blimp and could have no knowledge of its presence until it has surfaced. Under such conditions the lighter-than-air craft can use and have employed their armament of depth charges to excellent effect.

As for the sub-busting proclivities of airplanes of all types, one has but to look at the records of Britain's Coastal Command



Off the coast of Newfoundland airplanes patrol the sea lanes.

section of the Royal Air Force and our own Antisubmarine Command of the American Army Air Forces. The activities of the former began with the first hour of the war on September 3, 1939, and have relentlessly and increasingly continued to the present. Originally, Coastal Command was a small force with few planes and was necessarily limited in its scope. Now, it maintains constant day and night patrols from the equator to the arctic, from the Norwegian coast to the mid-Atlantic.

A 1943 report of the British Air Ministry concisely sums up the Coastal Command's manifold maneuvers as follows: "In the fulfillment of these duties, aircraft of Coastal Command, between 3rd September, 1939, and 30th September, 1942, has escorted 4947 merchant convoys, attacked 587 U-boats, and, if offensive operations against enemy shipping are included, flown some 55 million miles." It is obvious that these compilations have increased enormously since the issuance of this report.

On the American side of this flying patrol picture, Brigadier General Westside T. Larson is commanding general of the Antisubmarine Command, and is directly responsible to General Henry H. Arnold, Commanding General of the Army Air Forces. As the only unit of the AAF within continental United States which has been assigned to a major operational mission—which, in Army lingo means "shooting job"—Wings of the Antisubmarine Command patrol all coastal waters of both the Eastern Sea Frontier and the Gulf Sea Frontier. They escort scores of merchant ships hundreds of miles out to sea, and, in all, cover a million square miles of ocean.

Because the job of spotting objects on the water is a tricky one, and because aerial sub-busting requires specialized combat crew training, all pilots, co-pilots, navigators, bombardiers, radio operators, gunners, and engineers who are accepted from Army Air Force Schools for service with the Antisubmarine Command are given special courses at a school on the eastern seaboard.

There they learn the proper method of scanning the horizon, the correct technique for dropping bombs on U-boats, and other maneuvers and tactics necessary to the business of tracking down enemy submersibles from the air.

That phase of warfare involving combat between land-based planes and submarines is one of the developments of this war and, for the most part, is anything but a spectacular occupation. Long, weary hours of extremely tedious patrol, day after day, and week after week, may be devoid of all results save the knowledge that the shipping lanes have been well guarded and that, had a U-boat poked its snout from beneath the waters, it would have received a decidedly warm reception. When action does come, it is among the fastest and most furious, for a crew seldom has more than 30 to 60 seconds to "Sight sub; sink same."

Notwithstanding the relative rarity of enemy contact as compared to other branches of the Air Forces, experience to date clearly indicates that U-boat crews fear aircraft. They may take their chances on a surface battle with PC- and DE-boats, or with other naval units, but they will crash-dive in "nothing flat" if they see the oncoming airplane in time to make the maneuver. Furthermore, they will remain submerged as long as possible if they have reason to believe the planes are overhead.

To make things even more difficult for the lads in this service, both the Navy and the Antisubmarine Command are exceedingly chary about crediting a crew with the demolition of a U-boat unless positive evidence of its demise can be presented by the plane's crew. Flyers have said that in order to convince their superiors a sub has actually been destroyed, they must bring back the U-boat skipper's hat. And this one squadron did, producing not only the cap, but the cap's owner, as well. After effective bombing in this instance, the submarine sank, but its captain and some members of the crew escaped in rubber lifeboats. The squadron dropped additional life-saving equipment,

notified headquarters, and two days later the survivors were picked up by a Coast Guard ship. Needless to say, the evidence convinced even the most skeptical that the squadron had one sub to its credit.

A merciful by-product of the work of the Antisubmarine Command has been the saving of a considerable number of lives of sailors and merchant seamen who, when their vessels had been sunk by U-boats, or hopelessly disabled by storms, were forced to abandon ship and take to the lifeboats. One small boat off Cape Hatteras, containing 31 survivors of a freighter, was sighted by an AC plane. In response to a radioed report, other planes flew out to drop food, water, clothing, and blankets. Still another plane, a Coast Guard patrol bomber, scouted the near-by sea for aid, found a merchant ship some 15 miles from the lifeboat, and, by means of the blinker signals, gave the bearing of the survivors and led the vessel to the rescue of all 31 men.

Occasionally the Nazi U-boats will attempt to fight off an attack by plane or blimp, but it is generally believed that this happens only when the U-boat hasn't the time to effect a crash-dive. One German submarine crew, in July of 1943, doubtless felt very much elated over their success in downing one of our blimps, the only instance of this nature up to that time in the war. In reporting the loss of the blimp, the Navy gave no details of the engagement, but it was presumed that the submarine, on the surface, punctured the gas bag by machine gun or shell fire to such an extent that the airship was forced down to the sea. Fortunately, the blimp, as all American lighter-than-air craft, was filled with helium gas, which is non-explosive. This fact, and the theory that the ship came down rather slowly, were probably responsible for the saving of ten members of the 11-man crew.

According to the United States Coast Guard, if a person's eyes are just five feet above sea level, he has a range of visibility

of 2.5 nautical miles; if his eyes are 30 feet above the level of the sea, the visual range is 6.3 miles; if 100 feet up, it is 11.5 miles. Compare these ranges with those of the men in a plane 1000 feet or more in the air. A group of pilots of Pan American Clippers, those planes that have crossed and recrossed so many sections of the oceans so many times, worked out what they termed a "vision range" formula. They estimate that at 1000 feet, one can see for 39 miles; at 5000 feet, the distance is said to be 82 miles; at a 20,000-foot altitude, the vision is reported to be as much as 173 miles.

Obviously, small objects on the ocean cannot be seen from too high an altitude, even though the ocean itself may be visible for many miles, but it is equally obvious that height above that afforded by the highest "Crow's Nest" aboard a ship is a distinct advantage in spotting submarines.

In the Control Room of the Antisubmarine Command, sightings from numerous sources are received and compiled to present an expansive picture of the submarine situation and its relative menaces. In these Control Rooms, the heart of Antisubmarine Command's operational endeavors, staffs of communications experts from the Army, the Navy, and allied forces are on 24-hour duty to plot and evaluate the information received. As a situation at sea shapes up from the reports coming in to the Control Rooms, the officers in command scan the data carefully and flash orders which send aircraft and naval vessels to the critical area. Sometimes the information proves to be erroneous, for human eyes, however well trained, will play tricks, and the Antisubmarine Command takes this into consideration and is careful not to send out planes, ships, and men on what apparently would be a wasteful mission.

To get the broad, over-all picture of the two aerial patrols, British and American, their relationship to each other, to naval craft, merchant shipping, and enemy submarines, try to visualize



With depth charges ready, a Navy patrol plane cruises low in search of enemy submarines.

A patrol plane returns from a flight over a convoy.



a map of the North and South portions of the Atlantic Ocean. Bound the sea on the west by the two continents of the Americas, and on the east by Norway, the British Isles, the coasts of France and Spain, and the great bulge of Africa. Box in the top of this vast expanse of water with Iceland and Greenland. To say that the water within this box has an area of $31\frac{1}{2}$ million square miles means little to the average person; to state that the Atlantic Ocean contains twice as many square miles as the total land area of North and South America, combined, probably doesn't help much. If all the airplanes of all types in the whole world could each be allotted an equal amount of air space above the Atlantic in which to fly, all by itself, each plane would have approximately 165 square miles in which to range, about one-seventh of the area of Rhode Island.

Imagine, then, what it means to cover the coastal waters with a relatively small number of planes. The magnitude of the jobs of the British Coastal Command and the American Antisubmarine Command is quite overwhelming, but the fact remains that, week by week and month by month, since our participation in the war this service has become consistently more efficient. Working in the closest co-operation on both sides of the Atlantic, the Air patrols and the surface vessels of the United Nations have succeeded in driving the Nazi U-boats from the shores. The hunting grounds of the submarine now lie more nearly in the mid-Atlantic strip of from 500 to 600 miles wide which cannot be reached by aerial patrol craft from either side.

When a convoy laden with war supplies or troops leaves a Canadian or a United States port, it is, as everyone knows, escorted by a flotilla of warships of many descriptions. Destroyers, corvettes, PC's, DE's, and of late the newest escort aircraft carriers form a protective shield around the slower-moving merchantmen and troopships. Time was when the protective shield

was pretty thin in spots, and U-boats could find holes which permitted them to raise havoc with the convoy. Nowadays, things are different, as exemplified by a British War Ministry announcement early in August of 1942. The communiqué announced the triumphant arrival of one of the largest convoys of the war at an unnamed port. It said the convoy had been set upon by a pack of no less than 35 German submarines, but that the defense of the escort ships and planes was so efficient the Nazis never had an opportunity to loose a single torpedo, and that at least two of the U-boats had been sunk.

The location of the battle was not given, but presumably it occurred in the mid-Atlantic strip, for the planes credited with a large share in the successful defense were said to be those from the escort aircraft carriers accompanying the convoy. No doubt the long-range bombers of our Antisubmarine Command had kept aerial company with the convoy to the last possible mile, and along with them, to the extent of their somewhat more limited flying range, went the blimps, hovering, scouting, or poising motionless in their constant search of the ocean below from their vantage point above. Day after day the varied types of aircraft crossed in the air over the stodgy convoy, circled it, ranged far out to sea ahead of it, and dropped astern, ever on the lookout for the telltale sign of a submarine.

Eventually, however, the blimps had to give up. Their effectiveness terminated with the outermost end of their cruising potential. Some of the more powerful planes continued to make the run, but soon they, too, found the distance from shore to convoy and return beyond their flying abilities. Then it was time for the carrier-based aircraft to take off into the spotlight of aerial protection. To some extent they had already assisted the land-based planes and the blimps, but when the convoy reached the Atlantic mid-strip, it was entirely up to them. It was their job,

and theirs alone. That they were eminently successful is attested to by this particular British announcement, as well as by other communiqués.

Meanwhile, through channels known only to those in charge of the war effort, the British Coastal Command had been notified of the approach of the convoy. The moment this armada of merchant vessels and escorting warships came within flying range of the big British Short Sunderlands, the American-supplied Catalinas, which often are on ocean patrol for as long as 12 hours at a stretch, and other Coastal Command planes, the convoy once again had supplementary air protection against both submarines and any enemy aircraft that might be so brash as to attempt an attack.

There have been various reports and numerous articles regarding the use of helicopters as additional aerial protective craft in the 500-600-mile Atlantic mid-strip, but at this writing there has been no official confirmation of such use. That they could be so employed would seem altogether reasonable, for the "flying windmill's" uncanny ability to rise from or descend to a very small landing place is well known. The Army has been experimenting with a Sikorsky-made helicopter since May, 1942, and has stated the belief that there are many wartime uses to which it reliably can be put. Some of the Army's take-off and landing tests were performed off the Atlantic coast with a tanker as the base, and it has been stated that the Maritime Commission and War Shipping Administration were preparing early in 1943 to build small helicopter take-off decks on Liberty ships.

As to actual use by the American or British Navies as an anti-submarine weapon, Lowell Thomas, in his radio broadcast of April 21, 1943, said: "A great new development in the art of human flight has just been announced. We are informed now that helicopters are being used extensively against Nazi U-boats. The helicopter, that kind of flying machine which can rise

straight up, hover in the air, come straight down—long the dream of aeronauts—and now, all of a sudden, we hear that not only has the helicopter become a real and practical thing, but also that it's in operation—a major weapon of war; helicopters in large numbers being used as protection for convoys out in the Atlantic, rising right off the decks of freighters.”

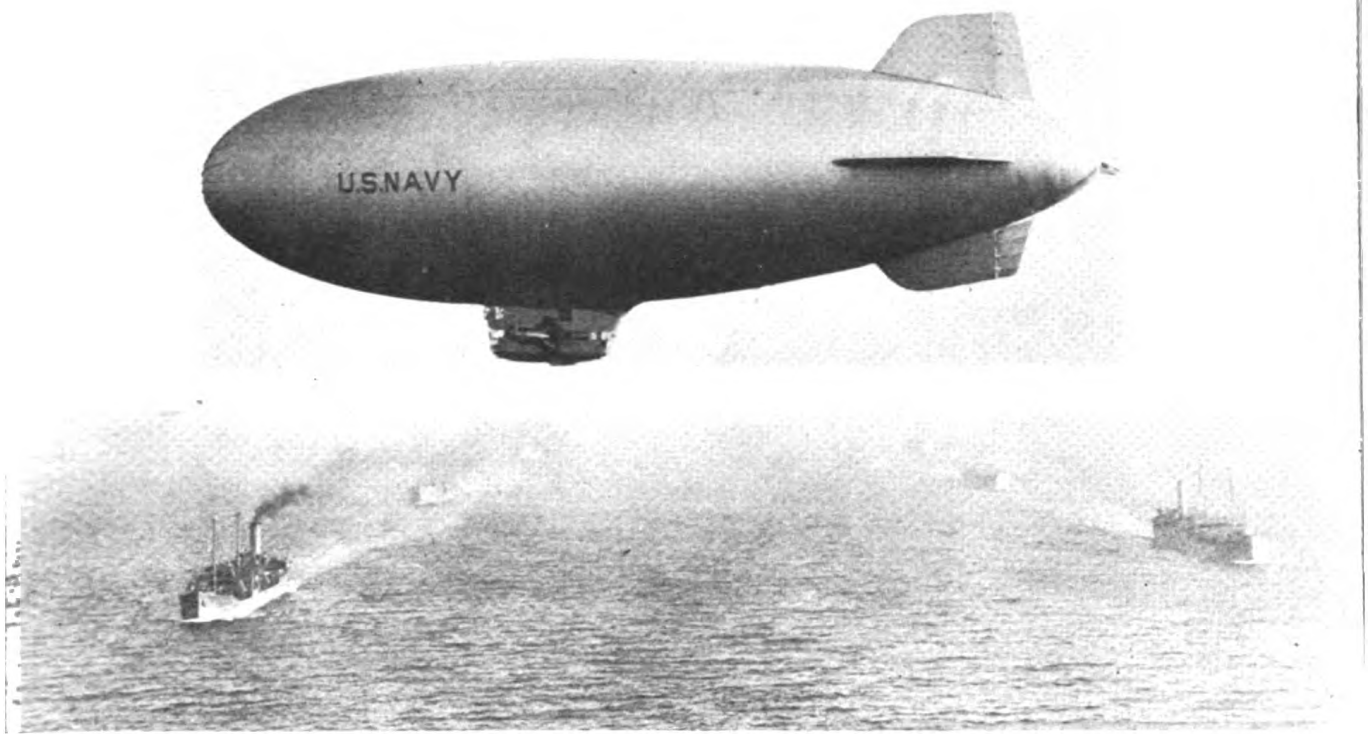
Unfortunately, however, it later appeared that the radio broadcast, as well as newspaper stories of that date, both based on a press release, were somewhat premature because, among other reasons, neither the British nor the American Navy had, at that time, any helicopters. Be that as it may, the reports of helicopters as anti-sub weapons have reached the ears of German U-boat crews who, when captured, ask worried questions about the newest allied aerial sub-buster.

Such, in brief, is the part played by aircraft in sub-busting. Details of the many exploits of the services involved must await another day for greater and richly deserved elaboration. They will make an interesting story, a story of dangers encountered, of hardships and problems overcome, and of a new type of sub-busting endeavor, entirely novel to this war, but one which well may presage important changes in the tactical wartime usage of submarines in the future.

THE "PADDED CELLS"—ACES
AMONG SUB-BUSTERS

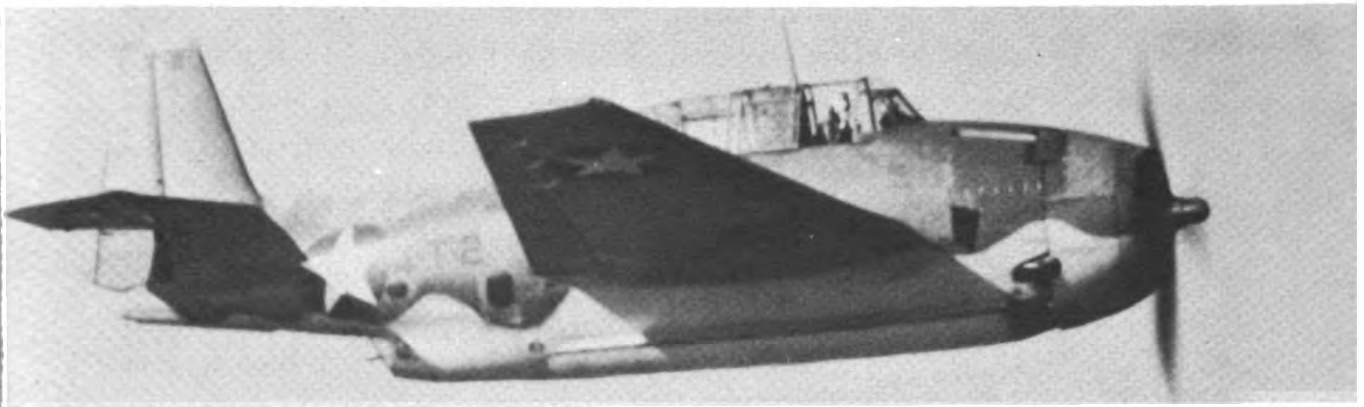
TO NAVY MEN, THE DESIGNATION "PC-boat" stands for many things. It can mean "Padded Cells," "Spit Cans," or "Broncos of the Sea," depending only on a choice of terminology, but above all, it means one of the deadliest anti-submarine weapons ever devised, and it signifies a branch of naval service that is second to none in the physical, mental, and psychological demands made on the human system. There are few men over 30 years of age serving aboard PC-boats, and nine out of ten new PC-sailors are unpleasantly seasick when first they try to adjust their stomachs and digestive organisms to the pitching, tossing, rolling PC's. Most of the green-gilled seamen recover from the initial nausea in a few days and thereafter are seldom troubled by rough weather, but a few simply can't take it and have to be transferred to calmer, less boisterous branches of the Navy.

It was Merlin F. Stonehouse who wrote in *Our Navy* of the toast offered the PC's by a British sailor. The Limey said: "'Ere's to the PC's—they go like crazy on a mad sea, and 'ere's to them sailors just as fighting mad as their ships, the PC's—better known as the Padded Cells." Yeoman Jimmy Fritz called them "Broncos of the Sea" in his article in *Motor Boating*, and explained that as the destroyer in naval parlance is a "Tin Can," so the PC, as "the Baby Sister to the Tin Can, just had to be christened with a name which, although it may not be a very



Hovering over a brood of merchantmen, a Navy blimp searches for enemy submarines.

Sinking low over the water a Navy TBF-1 Torpedo Bomber plane cuts loose its lethal cargo.



beautiful one, is very descriptive of the actions of this tiny escort vessel when she is out to sea"—the Spit Can.

Call them what you will, they had their origin in the last war in the form of a much smaller ship, then termed SC. They were only 110 feet long, their cruising range was but 500 miles, they were powered with three gasoline engines, they were affectionately called the "Splinter Fleet" because of their oak and pine construction, but the 440 of them that went to sea contributed mightily to the downfall of the 1917 German submarine offensive. They were originally designed by Captain A. Loring Swasey, who was called from retirement some years ago to work on a newer and larger model of a sub-chaser which could carry on the valiant work of the former SC's, some of which are still in active service.

The result was that two experimental ships were launched in 1938, and so satisfactorily did they perform that 72 more were authorized under the 70-Percent Expansion Act of July, 1940. In January of 1941, 400 more were contracted for, and in November of that year, just prior to Pearl Harbor, the Navy was instructed to build, acquire, or convert a second lot of 400 ships which could be classified under the loosely used cognomen of PC's. These descendants of the old Splinter Fleet range in size, being 170, 173, 175, and 180 feet in length, and each model differs from the others in various minor arrangements, but are built and armed for the specific business of sub-busting.

The officers and the enlisted men who make up the personnel for PC-boats are comparable in every way to those who man the DE-boats. They come from cities and farms, from high schools and colleges. Quite a number of them wear hash marks, the service stripe of the Navy, and have seen action in many parts of the world. When a new crew has been fully formed and trained and is ready to take over its new ship, it will be composed about half-and-half of older men and new sailors.

Despite the intensity of life aboard a PC and the grueling labor it involves, the PC-service is one of the most popular branches of the Navy. The reasons are many, and varied, but uppermost among the appeals is the desire for action, for contact with the enemy. Then, too, the chances for promotion among both enlisted men and officers are enhanced on the smaller ship. The lieutenant or ensign is of considerably more importance on a vessel with but a half dozen officers than he would be aboard a battlewagon where, of necessity, there is far more gold braid than on a dozen PC-boats. The ability, the intelligence, the versatility of the enlisted man can all be more carefully observed and more rapidly rewarded among a group of 60 sailors than in a crew of 2000 or more.

But if the service is desirable, it is also difficult of attainment. In one graduating class of budding naval officers at one of the Navy's special training schools, 250 expressed a desire to receive their commissions in the PC-service. One was accepted. Men who command the PC's must be good, and they are.

Each officer aboard a PC more often than not performs many duties and tasks not classified as official for commissioned men in similar occupations on larger vessels. The skipper, usually a lieutenant, is, of course, responsible for the entire care, operation, and conduct of the ship, whether in port, on escort duty, or just engaged in plain sub-busting operations. Battle tactics are his worry, as is also the job of overseeing the work of his assistants. Many skippers or "captains," as they are called aboard their own ship, are extremely young, often not out of their 20's, but few indeed have been instances of inability to command in adequate and responsible fashion.

That these youngsters are doing a grand job was attested to by one Lieutenant Commander of many years' service. He is in charge of a Navy Section Base on the Atlantic Coast where PC-boats put in for minor repairs or for supplies, and many are the

unpublished stories and experiences that come to his ears. "I take my hat off to this new generation of Navy officers," he said. "Frankly, I was fearful that they wouldn't have the stuff in 'em to take over and command ships like these, but I owe 'em an apology. Why, these kids have a million dollars' worth of ship under their feet, and they take more pride in her upkeep and care than many an older skipper I could name."

The executive officer of a PC frequently performs the duties of the navigation officer as well as his own. The former include all reports, requisitions, recommendations, orders, and the rest of the voluminous paper work that must be done if a PC is to function properly in her very active existence. As navigator, there are charts, courses, soundings, and sights to be considered. The dual role that the "Exec" often plays aboard a PC leaves him little time for boredom, or anything else, for that matter.

The engineering officer, too, finds his life a busy one. He, likewise, may serve in two capacities, communications being the other half of his twin responsibilities. In his engineering job he controls all the complicated machinery, including the huge Diesels. He is responsible for the work of about a quarter of the crew, and for all supplies except food. Breakdowns do occur, sometimes under the most trying of circumstances, but they must not be permitted to interfere with the efficient operation of the ship any longer than is absolutely necessary, and repairs must be made at top speed, regardless of anything and everything. As communications officer, he has supervision of all messages to or from the ship by any of the various methods. The sound-detecting devices fall within his realm, and all reports concerning the activity of this complicated apparatus pass through his hands.

Under the commissary officer come the galley crew, its kitchen and refrigeration equipment, and the quantities of food needed



Navy patrol, non-rigid airship moored to special mast.

to keep 66 hearty-eating sailormen in fighting trim. Before showing off on one of the PC's habitually lengthy voyages of convoy or sub-hunting, the larders must be stocked not only with a wide variety of canned foods and staples, but also with fresh meat, milk, vegetables, and fruit to last at least three weeks before having recourse to the preserved varieties. Meals, and well-balanced ones to provide the right amounts of nutritious foods, have to be planned long in advance, and though the seas may be mountainous and the wind roaring and screaming around the flying bridge, there must always be hot coffee and sandwiches for hungry men when they come off watch.

Eating aboard a PC, when she is showing her bows to the skies one minute and to the inside of a huge green comber the next, is an art all in itself. To down a cup of coffee or a bowl of soup amid the pitch and toss of these little ships requires the deftness of a juggler, the sure-footedness of an acrobat, the luck of the Irish, and a cast-iron digestive system to hold it once it is down. Many a man learns to lean back against the mess room wall, brace himself with his feet firmly on the edge of the table, and hold a soup-bowl containing meat and potatoes between his knees.

Nearly all the men who end up in PC-service are trained at the Submarine Chaser Training Center, established by the Navy in the spring of 1942 at Miami, Florida. Originally, the Navy took over Pier 2 of the municipal wharves with the intention of training some 600 men for sub-busting operations. Today the school has a constant enrollment of several thousand. Pier 3 has been added to the facilities, as has a brand new Navy drydock specially constructed for repairing PC's and other sub-chasers, and seven of Miami's hotels were at one time required for the housing, schooling, and feeding of the trainees during their 60-day course.

The training is highly operational, and the grim, conscientious

spirit that motivates instructors and students alike is keynoted to a new class of enrollees every Monday morning by two-fisted, hard-punching Commander E. F. McDaniel, who came off a destroyer command to set up the Center, and who lets it be known that before the war is over, he hopes to be back on the fighting line, doing the very things he is now teaching to new sailors. Commander McDaniel's remarks to the newly arrived men do not constitute a lecture. Instead, they establish a credo that is forceful, combative, and almost primitive in its coldly logical explanation that these lads are embarking in a work which demands they either kill the Nazi sea beast, or be killed. There are no heroics, no staged dramatics about this talk. It is a simple, quiet statement by a sincere man who has “been there,” who has seen the horrifying results of unrestricted Nazi U-boat warfare, and who knows what it means to attempt to put an end to such atrocities.

The Commander's words are extremely effective. They serve to buoy up the men through long, hard days of intensive study and operational training. In many respects the curriculum is comparable to that of the DE-men at Norfolk, and, as has been explained, many DE enlisted men and most of the officers come from the Center. There are classes and practical experience in engineering, communications, sound apparatus, electricity, seamanship, yeoman training, and gunnery. There is a mock-up ship, there are instructional movies and other illustrated lectures; there is a Lookout and Polaroid room, and there are huge laboratories for assembling and disassembling all manner of guns and the mechanical gadgets and engines that are parts of a PC-boat.

Like the DE, the PC is distinctly a specialist ship and needs specialists to man her. Regulation armament of some of the older PC's includes one large gun forward, two anti-aircraft positions amidships, a second large gun aft, and scores of ashcans, both in racks on the fantail and for expulsion by K-guns and

to keep 66 hearty-eating sailormen in fighting trim. Before showing off on one of the PC's habitually lengthy voyages of convoy or sub-hunting, the larders must be stocked not only with a wide variety of canned foods and staples, but also with fresh meat, milk, vegetables, and fruit to last at least three weeks before having recourse to the preserved varieties. Meals, and well-balanced ones to provide the right amounts of nutritious foods, have to be planned long in advance, and though the seas may be mountainous and the wind roaring and screaming around the flying bridge, there must always be hot coffee and sandwiches for hungry men when they come off watch.

Eating aboard a PC, when she is showing her bows to the skies one minute and to the inside of a huge green comber the next, is an art all in itself. To down a cup of coffee or a bowl of soup amid the pitch and toss of these little ships requires the deftness of a juggler, the sure-footedness of an acrobat, the luck of the Irish, and a cast-iron digestive system to hold it once it is down. Many a man learns to lean back against the mess room wall, brace himself with his feet firmly on the edge of the table, and hold a soup-bowl containing meat and potatoes between his knees.

Nearly all the men who end up in PC-service are trained at the Submarine Chaser Training Center, established by the Navy in the spring of 1942 at Miami, Florida. Originally, the Navy took over Pier 2 of the municipal wharves with the intention of training some 600 men for sub-busting operations. Today the school has a constant enrollment of several thousand. Pier 3 has been added to the facilities, as has a brand new Navy drydock specially constructed for repairing PC's and other sub-chasers, and seven of Miami's hotels were at one time required for the housing, schooling, and feeding of the trainees during their 60-day course.

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Y-guns. The number and types of ashcans vary, however, with the assignment given the ship.

The very nature of PC-service demands that frequently the crew will be away from port for weeks at a time. There'll be no mail and, despite the busy life, there will be moments of boredom, for all is not excitement or combat in the course of convoy or patrol work, or even in the business of sub-hunting. There is a perpetual guard at all stations when at sea, with four hours on and eight hours off, but this is reversed to eight hours on and four hours off when in danger zones. In all, the crew of a PC puts in 168 hours a week for as much as eight months at a stretch with no vacations for the duration, no overtime pay, no bonuses, and no liberty save when there is a job of overhauling or while supplies are being taken aboard.

It's a tough life, but a fine crew aboard a PC. There are few lives tougher and no crews finer anywhere in the Navy, and even though PC-boats are never dignified by names, as are cruisers, destroyers, battleships, and many other Navy craft, the loyalty of an individual crew to PC-565, PC-452, or any other number, is unsurpassed. The PC's are equipped with everything needed to do the job for which they were designed—to bust the U-boats. Scores upon scores of them have gone down the ways and out to sea since Pearl Harbor, and scores more are joining the earlier ones. They already have performed magnificently in the fight to drive the Nazi U-boats from proximity to our Atlantic and Gulf of Mexico shores. Just how successful they have been is best demonstrated by the fact that the coastal sinkings have all but ceased, and the submarine has been chased far out to sea.

Given enough of the tough, hard-fighting PC's, along with the DE's and the other successful sub-busting warships and aircraft, the Navy will once more prove the soundness of the basic principle which licked Admiral von Tirpitz's U-boats in 1917 and which ultimately will be the downfall of Admiral

"PADDED CELLS"—ACES AMONG SUB-BUSTERS 203

Doenitz's much larger fleet of submersibles in this war—thoroughly disorganize, disrupt, and overwhelm the U-boats with so many various types of its enemies that they have no free areas in which to function. When that is accomplished, Hitler's days will be numbered.

If that weren't a U. S. submarine below, the blimp would have a perfect target.



THE "DUNGAREE NAVY"

FROM THE MOMENT THE first Jap bomb landed on Pearl Harbor, our Navy was about as busy as the sergeant with St. Vitus' dance who tried to pick cooties out of his shirt. Our 171 destroyers had innumerable jobs cut out for them in all Seven Seas at once. The rest of our fighting ships were equally occupied, and as there was small likelihood of a Nazi naval attack on the Atlantic Coast, much of our Navy was elsewhere. That meant all too few ships to guard our coastwise freighter lanes against the submarines which were prompt to seize the opportunity to hunt in coastal waters, actually in sight of our shores.

To combat this business of smashing ships right on our front doorstep, we needed ships, scores of ships, and their necessary personnel. The Coast Guard and such few other armed ships as were available performed heroic deeds, with long, arduous hours on duty in the bitter winter months, but it required more than all available units to patrol nearly 2000 miles of Atlantic coast line, to say nothing of the Gulf and Pacific sea frontiers.

Within a short time after the initial shock of the Jap sneak-thrust, the problem of more men was solving itself with the thousands of volunteers who enlisted daily in the Navy, the Naval Reserve, and the Coast Guard. Long-planned schools for Naval Reserve junior officers at various colleges, to supplement the existing schools at Annapolis and on the training ship

Prairie State, went into operation overnight. "Boot Camps" for seamen were inaugurated here, there, everywhere.

Specialty schools followed for men who would be motor machinists, firemen, signalmen, or who wanted to become proficient in the use of sound-detecting apparatus, so vital in the hunt for submarines. All in all, the manpower problem more or less took care of itself, with only the customary hitches and difficulties attendant upon the influx of great numbers of men. Of this vast array of new sailors, many would soon be ready for service in a coastal patrol that could and would chase the subs from our waters—but where to get the ships?

No time to build them, for they were needed at once, and if boats were only available, enough sailors could be found to skeleton-crew them until the new crop would begin to sprout from boot school. The War Shipping Administration had under way a program for the building of PC-boats—approximately 110- and 170-footers—but the requisite steel, Diesel engines, brass fittings, and armament remained as problems that slowed production.

About then history decided to repeat itself. According to shipping registers there were some 7300 privately owned pleasure craft, of which a score or so were steam-driven, ocean-going yachts. Between 200 and 300 were gasoline-powered boats over 75 feet long, and the remainder were shorter and of all sizes, shapes, dimensions, conditions, and seaworthiness. In the last war, boats of this variable class had played their parts—they could do it again, just as the British had done it since Schicklgruber started his world bonfire.

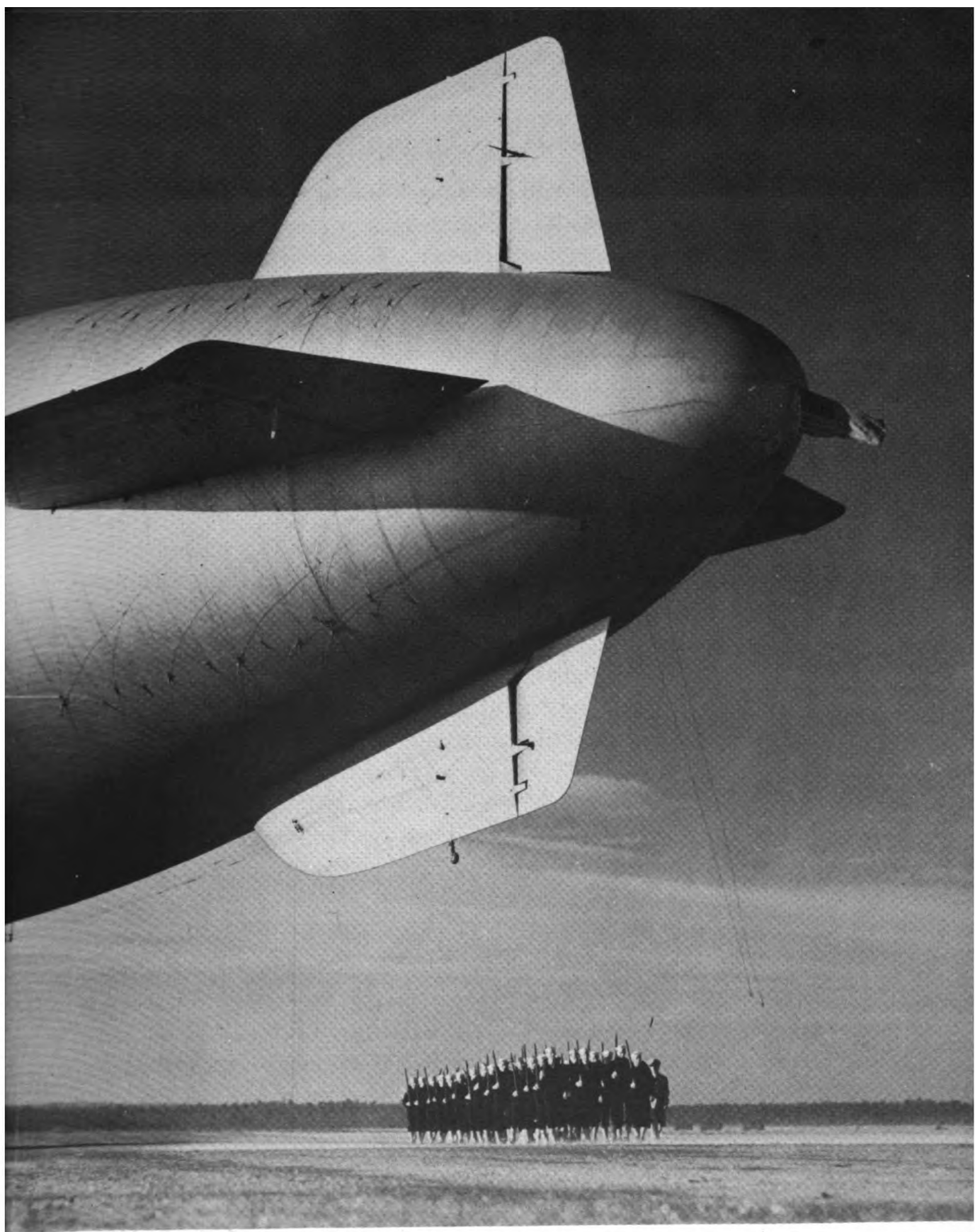
As in 1917, the Navy promptly scouted every coastal harbor, yacht club, and mooring place where feasible and serviceable ships might be found. They came up with as variegated an assortment of bottoms as can be imagined—and with them, whether or not the Navy liked it, as daredevil a crew of amateur

skippers as ever tasted brine, and who insisted on accompanying their ships into naval service. Many of these craft were hopeless, some could be utilized for short, close-to-shore patrols, and a few might be converted into really valuable protectors of our coastwise shipping.

A lot of work had to be done on them, but basically they were all right. They could make a good speed, and "as soon as we get some machine guns and depth charges, we'll arm you to the teeth. Meanwhile, here's a box of 25-pound hunks of dynamite with 11-second fuzes to use in place of the ashcans you'll get later, and here's a Tommy-gun for good measure. Now get goin', you guys, and patrol that coast!"

And that's the way some of the earlier patrols went out to fight the Nazis. That all happened months ago, and today the veterans of the Splinter Fleet, formerly known as SC-boats, now bearing the letters "YP" (Yacht Patrol), on their bows, are armed from stem to stern, from scuppers to flying bridge. They're manned by as fine and efficient crews from the "new Navy" as one would ever want to see in action. They not only patrol our coasts day and night, they are back in convoy duty, this time guarding our coastwise shipping in a manner that bodes very ill, indeed, for any Nazi undersea raider that dares to invade the Atlantic coastal shipping lanes. In this work they are ably assisted by modern Coast Guard cutters, likewise loaded with a lethal cargo which every man jack is anxious to deliver. Combined with these American naval forces is an occasional minesweeper, an armed British trawler, or a British or Canadian corvette.

The efficient manner in which these little ships have been handled ever since they first shoved off—and many of the men were then but a few weeks out of boot school—is something Hitler and Hirohito ought to see. It would doubtless disturb their slumbers still further to learn that our new Navy, as truly



At Lakehurst, New Jersey, a blimp takes off during the changing of the guard.

American as ever, with its Mulligans, Burkes, and Degnans, its Luziettis, MacLeods, and Crosbys, can learn the ways of battle at sea so quickly and so thoroughly. For of the three officers and 16 members of the crew of the YP-191, for example, all of them Naval Reservists, only one had ever seen Navy service prior to December 7, 1941. That one was Quartermaster First Class, John H. Hanson, of the U.S.S. *Topeka* in the last fracas, and a Legionnaire from Burlington (Vermont) Post.

As with many another Legionnaire, Jack Hanson found the call too strong to be denied, so he's back at sea once again—a veteran seaman on a veteran sub-chaser—and this time it's the "Dungaree Navy," an aptly descriptive term for fellows who man the little boats that have chased the Nazis from Atlantic shores. While the officers dress in Navy khaki, the deck crew, the "black gang," and cookie all wear dungarees at sea, and most of them are naked from the waist up when weather permits. Discipline is excellent, but it's an informal sort of control, befitting the cramped quarters of a small boat, and it produces a co-operation, a loyalty, and an admiration on the part of the crew for the officers that would delight any four-striper.

In "The Ships and Aircraft of the U. S. Fleet" are listed 40 former privately owned yachts that were acquired and converted by the Navy during 1940 and 1941. Most of them have been rechristened, so their present names would mean little to those who, in pre-war days, followed powerboating, but they range in size from the 103-ton PC-454, formerly the *Arlis*, to the 3015-ton *Vixen* (PG-53), once better known as the *Orion*, and more lately serving as Flagship of Submarines, Atlantic Fleet. At least one, the *Niagara* (PG-52-ex-CMc2), is known to have been a casualty. She was one of the first tenders assigned to service with the Motor Torpedo Boat squadrons, and according to a Navy communiqué, was severely damaged by a Japanese plane attack off San Cristobal Island, in the Solomons, on May

23, 1943. After removal of most of the officers and crew, she was sunk by our own forces. In private life, the *Niagara* was once known as the *Hi-Esmaro*, and was the property of Mr. H. E. Manville.

According to their size, ships of this swank flotilla, now in fighting battle gray for the duration, were assigned different classifications and duties. Those over 1000 tons are known as Gunboats (PG), those of 500 to 1000 tons as Yachts (PY), some of those under 500 tons as Coastal Yachts (PYc), and the balance of the smallest group as Submarine Chasers, carrying the general class symbol of PC. Armament varies from machine guns and a few depth charges on the smaller vessels to those ships that mount four-inch cannon and a full-sized rack of ashcans. Strangely enough, many of the larger yachts now combating submarines were constructed in Germany during the 1920's, the *Vixen* having been launched at Kiel, one of the busiest Nazi U-boat bases. Another, known in civilian-dress days as the *Yankee Clipper*, served in the last war under the name of the U.S.S. *Sialia*, and is now back in the Navy again under the cognomen *Coral* (PY-15).

Even some of the 112 World War One square-sterned, 500-ton Eagle Boats, ordered from The Ford Motor Company back in 1917-18, have returned to service. The records show that of that original order, 60 of the 205-foot ships were completed, the rest canceled. Eight of the 60 remain on the list today, bearing the numbers PE-19, 27, 32, 38, 48, 55, 56, and 57. They have geared turbines driving one propeller, and have been described for King Features by John Cashman, who served aboard one of them, as: "narrow-snouted, droop-sterned, pot-bellied, and cramped. . . . The engine room is a jungle of ancient piping and valve wheels, and there seem to be 10,000 pumps in the vitals of the ship, all of them whining, groaning, and screaming." Nevertheless, these honorable ancients have been doing their

share to guard our coasts against trespass-minded Nazi U-boat commanders.

Among other antiquated, but as yet sturdy and faithful, regular Navy ships still very much in action are some of our early Gunboats, once a numerous type. The *Tulsa* and the *Asheville* were based at Canton, China, prior to the war, and the latter is now marked as a casualty. The *Sacramento*, on Asiatic Station for years, now serves with the Inshore Patrol in the Atlantic. The *Paducah* and the *Dubuque*, true veterans of the shipways of 1905 and classed as training ships between the wars, have now turned that duty over to other ships or to land stations and returned to the fighting fold. As the scent of the sawdust is irresistible to the old circus performer, so does the smell of burning gunpowder bring "the old ladies of the Navy" steaming back to fighting fronts.

The term "Patrol Craft" is an all-inclusive one, as well as a phrase which can be confusing to the civilian, and sometimes even to Navy men, for the symbols "PC" indicate not only this large group, but also a specific type of escort vessel. Speaking of the group and not of the individual ship type, "The Ships and Aircraft of the U. S. Fleet" states: "187 Patrol Craft were in service on December 1, 1941, ranging from the six-inch gunned *Eries* down to the tiny but deadly PT's. Another 247 were building or under conversion. Most of the smaller Patrol Craft operate with local defense forces from Section Bases, recently established along both coasts and in Island Possessions as part of the Naval District organization, on British Territory in the Atlantic, and on Danish Iceland and Greenland. Through 1940-1941 a dozen Coast Guard cutters operated under naval command. On November 1, 1941, the U. S. Coast Guard became part of the Navy."

As to the specific PC-Escorts, analogous to England's corvettes, the PC-451 and 452 were the first steel-hulled PC's of their

group, and were built at Bay City, Michigan, in 1938. Following the 451's pattern came 72 more of these 165-foot PC's. A second order of 50 vessels of 173-foot length are near duplicates of the PC-452, which differs from the 451, and still additional contracts have been placed for both types, but details of these newer ships are restricted by wartime necessities. They are being built at smaller shipyards on both coasts, on the Great Lakes, and on Inland Waterways. First of the wooden-hulled PC's were the 449, 450, and 453, all 110-footers, and each varying slightly from the others as experimental types. Outwardly, the wooden-hulls resemble the PC's (speaking of the group) of the old Splinter Fleet, and before hostilities opened in 1941, contracts were awarded for 90 more.

As to the Coast Guard, that, in itself, is a book, as Mr. Henry Felsen has so ably proved by writing "He's in the Coast Guard Now." For this record, suffice it that: "The Coast Guard constitutes a part of the military forces of the United States, operating under the Treasury Department in time of peace and as a part of the Navy in time of war, or when the President shall so direct. . . . Its principal duties in peacetime are the enforcement of maritime and customs laws, operating aids to navigation, protecting fisheries, iceberg patrol, the saving of life and rendering assistance to vessels in distress. Established in 1790, the Coast Guard is an amalgamation of three services. The old Revenue Cutter and Life Saving Services were combined in 1915. The Lighthouse Service became part of the Coast Guard on July 1, 1939. At the end of Fiscal 1941, there were 278 Coast Guard vessels other than Motorboats and Lifeboats on the register. Another 52 were building. Before hostilities opened, about 400 civilian craft formed the Coast Guard Reserve, now on active service."—"The Ships and Aircraft of the U. S. Fleet."

This, then, is the Inshore Patrol. These are the young men and the veterans, these are the new ships and the old, whose

valiant efforts have driven the Nazi and Japanese submarines from the 1888 miles of the Atlantic coast, from the 1629 miles of the Gulf coast, and from the 1366 miles of Pacific coast frontier. A terrific undertaking, a prodigious accomplishment, and one that will go down in the history of this war as having contributed heavily to the ultimate defeat of all enemy submarines, and particularly to the downfall of the "unrestricted" U-boat campaign, begun by German Admiral Alfred von Tirpitz in the last war and continued by von Tirpitz's ablest student, Admiral Karl Doenitz, in this war.

Without the vast organization of the Inshore Patrol, its hundreds and hundreds of little ships, its thousands of able enlisted men and officers, and all its other component parts, including those in the air as well as those on the sea, our larger fighting ships could never have been utilized to such splendid satisfaction everywhere else in the world. In short, without the Inshore Patrol, we could not hope to win this war.

A simple-looking gadget, the helicopter may prove the answer to mid-ocean patrol.



THE U-BOAT MENACE—IT CAN
BE BEATEN

OUR FIGHT AGAINST
enemy submarines is the most critical fight of this war.

Paramount in importance as are the Russian front, the attacks by air, sea, and land on Hitler's Fortress Europa, they cannot succeed if Nazi submarines are victorious in cutting or seriously hampering the Atlantic supply lines. Sovereign as may be the necessity for annihilating the now far-flung Japanese Empire, our naval transport system must stay on top of the oceans to accomplish this much-desired end. Thus far the menace of the German submersible fleet has proved far more dangerous than that of the Rising Sun. The Japs are supposed to have a total of about 80 subs, approximately one-sixth the number credited to the German undersea armada.

The sporadic attempts of Nippon's submarines to terrorize the west coast by shelling were marked with sophomoric inefficiency and glaring mistakes in naval strategy. Their pitiful efforts to utilize successfully their miniature two-man subs have consistently availed them little.

In the Nazi operations, however, there is no sign of ineptitude or lack of knowledge of submarine tactics. To the contrary, every phase of German submersible strategy indicates a typical Teutonic meticulousness toward a long-considered, well-planned submarine offensive, as indeed it was and is. With the greatest array of land and air forces the world has ever witnessed the

German High Command has known all along that if it wins this war, victory will come at sea; not in repulsing allied invasions of the continent, not in the taking of Moscow, not alone in the once-conceived aerial smashing of England.

To win this war, we must maintain the Atlantic supply lines. For a Nazi victory, these lines *must* be cut. This point of view was publicly confirmed late in 1941 by Vice Admiral Walter Warzecha, and has more recently been emphasized by no less than the Grand Admiral of the German fleet, Karl Doenitz.

What is more, the over-all Nazi strategy, from the day of Poland's invasion in 1939 to the present, makes it all too clear that Hitler's plans for carrying out his world-conquering blueprint in "Mein Kampf" early took into minute consideration the thought expressed in a recent statement by Admiral Doenitz: "We are facing the two greatest sea powers in the world [Great Britain and the United States], and those two powers are determined to conquer us."

There can be little doubt but that the present deadly menace of submarine warfare had its germination in Hitlerian minds in the unmitigated and horrifying success of German "untersee-booten" in 1917. Under the capable and ruthless Admiral Alfred von Tirpitz, the Kaiser's subs destroyed \$5,000,000 of allied shipping and caused the death of 40 men every day during the holocaust's height in April of that year. That campaign succeeded in sinking in one month over 885,000 tons of shipping—approximately the entire November, 1942, American record production of 84 vessels totaling 891,700 deadweight tons.

The Germans did that in 1917 with slightly less than 140 U-boats.

Today, the Nazis are believed to possess between 400 and 500 submarines, vastly improved in offensive and defensive armament over those of that other war, and at least a third of this enormous fleet is said to be on patrol at all times. What

American and allied losses in men, ships, and munitions have been and are as this is written have not been made public. One is left to draw one's own conclusions from a study of available and comparable figures. The conclusions cannot be pleasant. That the success of von Tirpitz has been equaled or surpassed by the present-day campaign of Admiral Doenitz would seem apparent.

Part of this is due to a greatly expanded range of submarine bases over those available to the Germans in 1917—again, a phase of Hitler's "master plan." Part of it is traceable to the immensely improved type of undersea vessel now in use. Part of it is due to American and allied unpreparedness in the types of offensive and defensive weapons necessary to combat submersibles. Some of these weapons were proved conclusively in the last war, and others, such as aircraft, have since then been developed.

In World War One the tens of thousands of mines laid in intricate patterns in the Heligoland Bight and off the Belgian coast hindered U-boat operation, but did not stop it. Nevertheless, there were no German bases in Denmark, Holland, on the north and west coasts of France, or in the ragged fjord hideouts of Norway. The Kaiser could reach the Mediterranean only via the Straits of Gibraltar or through Austrian outlets on the Adriatic Sea, while, originally, Hitler had all these stretches of coast line, including Italy, southern France, and the Grecian archipelago from which to release his vicious undersea raiders.

Ever since Der Fuehrer and his satellites began to lay plans for conquest of Europe and England, preparatory to eventual assimilation of all-world power, they have known that once again the United States could be the one great stumblingblock in their ironshod march. From America, as before, could come endless streams of supplies to strengthen Britain, France, and other countries scheduled for Nazi domination. There was but

one way to prevent such assistance from reaching the prescribed victims—submarines, and a man to command them who was almost as cruelly cold, as attuned to atrocities, as inordinately cunning as Hitler himself. That man proved to be Karl Doenitz, fanatically obsessed since World War One with the ghastly potentialities of unrestricted submarine warfare, and a great admirer and student of the able von Tirpitz.

With the confiscation of 176 German subs and 208 uncompleted hulls after World War One's Armistice, and with the Versailles Treaty's refusal to permit Deutschland to build further U-boats, the world at large heaved a sigh of relief, dropped the submarine problem and forgot it. But not Hitler. We now know that soon after he came into power secret construction of submarines in "knockdown" sections was instituted and carried to a most successful conclusion. Later, after abnegation of some phases of the Treaty, and after assertion of certain rights for the Reich, total secrecy regarding Nazi U-boat construction was no longer necessary. To make everything serene and friendly, however, the Germans signed the Anglo-German Naval Treaty in 1935. This limited Nazi sea power to 35 percent of England's in all types of ships except submarines, which were permitted to reach a figure of 45 percent.

Next, to cause sleeping dogs to snooze still more quietly, Ambassador von Ribbentrop publicly placed the Reich in accord with the 1930 London Naval Treaty, which had reiterated that merchant ships would not be sunk without warning. Japan was likewise a signatory to this pact. Then, in 1939, with the whip of Munich in his hand, Hitler announced he would build a submarine fleet equal to England's. That wasn't such a terrific job, for his sub-rosa U-boat building campaign had been going busily on since that treaty in 1935 to make up for the 55 percent difference between the submersible strength of Germany and Britain, as agreed to at that time.

THE U-BOAT MENACE—IT CAN BE BEATEN 217

Came the invasion of Poland, the period of "phony war," the abrupt and successful seizure of the Low Countries, Norway, and France—and suddenly and according to plan, Hitler had over 1000 miles of shore line fronting on the Atlantic and facing America's doorstep. No longer was there danger of Nazi U-boats being bottled up in the North Sea; no longer need the Reich fear the inevitable streams of supplies which, undoubtedly, they knew would soon start flowing across the ocean to England. Now they had territory for bases from which to launch the long-planned unrestricted submarine warfare—and for years the U-boats had been in production, either in their entirety or in parts which could be quickly assembled.

That portion of the present German submarine success attributable to improvement in underwater warships is traceable to thorough Teutonic study of the mistakes they made before, both in vessel construction and in the selection and handling of personnel. Coupled with and greatly augmenting these innovations is the development of "wolf-pack" tactics, which Secretary of the Navy Knox presumably recently referred to as the "new technique" of the Nazis. Thus far, the combination of these factors has proved altogether too efficient for the safety and security of the United Nations.

It is known that the entire German undersea service is now organized to overcome factors which caused it to weaken and finally crack in the last war. Whereas, before, many of the crews were drafted or ordered into service, all are now volunteers and are subjected to elaborate psychological tests to ascertain their adaptability to the grueling work. With promises of better living and working conditions, and promotions in rank when Germany wins, a far more democratic attitude has been attained with a camaraderie heretofore unheard-of in German naval ranks. To avoid falling morale due to widespread knowledge of lost ships, it is publicly known that U-boats rarely return to their

original bases, so extended absences are natural, and when the crews do receive liberty, they are not permitted to mingle too freely with civilians or other naval services.

While the Nazi submarine building program remains a closely guarded secret, and while Russian sources claim that, due to labor shortages, construction dropped from 200 ships in 1940 to between 120 and 140 in 1942, it is known there were U-boat factories and assembly plants in Italy, Norway, Holland, Denmark, France, and in Rumania, where the 250-tonner is built for Black Sea use. By no means have all of these enormous factories been bombed out of existence, or made inoperative.

There can be no question about it—the Germans have evolved a submarine fleet second to none in the world. They are excellent vessels in every detail. They are manned by picked, well-trained crews and officers who are avid disciples of the ruthless, pitiless savagery of which only Nazis and Japs are capable. Their systems of operation and attack have been proved successful—and Canada, England, the United States and their allies are faced with a titanic problem.

The situation is still far more serious than the average citizen realizes—it is *the* crisis in this war, *the* crucial passage at arms which we *must* win before we can even begin to think about victory.

What we have been and are doing about all this has been set forth briefly in the foregoing pages. To inscribe the full details of all operations would require volumes.

This sub-busting campaign of ours is a prodigious, many-sided program, somewhat tardy in getting under way, but now moving rapidly and successfully. Never in our history was time more of the essence than in this all-out effort to crush the U-boat, and among all our fighting forces none will be more deserving of praise and credit for the ultimate victory than the officers



In flight, a whirling windmill, but nonetheless a splendid lookout from above for subs.

If helicopters are ever used for sub-sighting, they can hover close above-decks for a re-load of depth bombs.



and men who take our sub-busters into battle. Nor, in the final summation, should those thousands of other behind-the-scenes men be lost sight of—the maintenance, service, and repair crews who keep the sub-busters in fighting trim; the officers of the United States Navy and their assistants, upon whose capable shoulders rest the heavy responsibilities of quickly and effectively training every man in the intricacies of his new job of busting Nazi subs.

If you could personally visit some of the training stations and schools, if you could fly with the crews of patrol planes and lighter-than-air craft, or go to sea aboard a racing PT-boat, or a new Destroyer Escort, you would instantly sense the serious intensity of this all-important phase of the war. There's a resolute grimness in the thought, speech, and action of every man-jack. Be he able seaman or "Three-Striper," tenacious determination sticks out all over him. He has a self-reliance that will enable him to "ride in the whirlwind and direct the storm," Admiral Karl Doenitz and his wolf-packs notwithstanding.

The ships, planes, blimps, and their sub-busting weapons of attack and protection take many and varied forms. Some are as old as the last war, tried and proved when the German submarine offensive of '17 and '18 was cracked and broken. Others have stood the test and proved their worth in this war. Still more are strictly "hush-hush," things that can be talked of in detail only on some future day, but all are effective, and together they form a pattern of offensive which bodes ill for the undersea marauders.

That pattern of offensive, in its broad terms, was set forth early in the spring of 1943 by Admiral Ernest J. King, Commander in Chief of the United States Fleet and Chief of Naval Operations. Admiral King stated that five methods of dealing with the U-boats were:

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1. Bomb the German factories and shipyards where the enemy builds his submarines.
2. Bomb the German bases where the component parts of the U-boats are assembled.
3. Bomb the bases to which the U-boats return for re-fueling.
4. Deal with the U-boats as they come and go in the Bay of Biscay.
5. Deal with the U-boats as they endeavor to attack our convoys.

The damage to which allied bomber squadrons have subjected Nazi U-boat factories, assembly plants, and re-fueling stations is difficult to measure. Certainly, the continued aerial pounding of Lorient, St. Nazaire, Rouen, Wilhelmshaven, Emden, Vegesack, and Kiel have disorganized the planned processes of submarine manufacture, overhaul, supply, and repair, but the actual extent of such bombardment, terrific punishment though it has been, is not easy to evaluate. Some authorities hold that because these construction and maintenance installations are so stoutly built, the war against the submarines will only be won when land forces take control of Axis major seaports from which their submarines now strike.

"There is no short and simple way to defeat the U-boat menace on the sea," declared Deputy Prime Minister Clement R. Atlee in the English House of Commons in April. "Just as in the last war, the Allies have to rely upon the cumulative effect of a large number of counter-measures."

A month later, after more and more convoyed ships had safely run the U-boat gauntlet, and with sinkings of submarines on the increase, Britain's Foreign Secretary, Anthony Eden, commented that the battle against the U-boats "continues to be encouraging. Our own new construction of merchant ships still is mounting, losses still are decreasing, and sinkings of U-boats

still are increasing. . . . The battle of U-boats still rages. It is not yet decided, but at least we feel better about it than we have felt."

Even the German claims regarding allied sinkings, usually exaggerated, at that time totaled only 282,000 tons for three-quarters of the month of May, 1943, figures which were at considerable variance with their claims for May of 1942, when 924,000 tons of shipping were alleged to have been sent to the bottom. Assuredly, then, the battle is beginning to go the way we want it to go.

Many of the reasons for this apparently favorable progress have been described or touched on in the earlier pages. They coincide closely with the five points mentioned by allied officials at about the time of Mr. Eden's remarks. These points were as follows:

1. An increased number of escort ships and planes.
2. Reorganized defense, including defenses stationed where none had existed before.
3. A newly developed long-range aerial patrol.
4. Effective anti-submarine devices.
5. Capture or killing of many of the best German U-boat commanders.

In accord with the improved U-boat situation, Admiral Harold R. Stark, Commander of United States Naval Forces in European waters, stated on May 1, 1943: "Far be it from me to belittle what the U-boat has done and is doing. I know it only too well—but I also know that the U-boat is fighting a losing battle."

On June 6, 1943, *The New York Times* stated: ". . . A British summary of German claims showed a sharply declining curve in the rate of sinkings. Warning that the figures were, as usual, highly inflated, naval observers listed the Berlin claims

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for submarine sinkings since the first of the year as follows (gross tons) :

| | | | |
|----------------|---------|-------------|---------|
| January | 522,000 | April | 415,000 |
| February | 576,000 | May | 372,000 |
| March | 851,000 | | |

“Allied spokesmen pointed also to successes in the offensive against submarines. Destruction of five U-boats in ten days by patrolling aircraft alone was reported in London. First Lord of the Admiralty, A. V. Alexander, said the number of submarines destroyed in the past year exceeded that for the whole previous period of the war, the last six months being especially effective. And on both sides of the Atlantic naval officers spoke of the rapid multiplication of known anti-U-boat weapons, as well as the development of new types. Destroyer Escorts, Escort Carriers, long-range patrol aircraft are among the weapons known to be employed in ever greater numbers; new ‘detection’ and tracking devices as well as improved depth charges that are more effective against the tough, double-hulled submarines are believed to be among the innovations.”

Yes, there can be no question about it, the Nazi U-boats have more than met their eventual match in the overwhelming number of our fighting surface vessels which now patrol the seas, and the scores upon scores more that are coming off the ways of allied shipyards. But it is going to take all that we have and all that we can make to finish the job. They must be obliterated, and even at the favorable increased pace of obliteration that obtains at this writing, nothing short of an internal crack-up of Axis strategy and government can shorten the long, costly struggle that lies ahead.

That our ships and sailors, our planes, blimps and their crews, are capable of doing the job and doing it well is not open to question. On the antiquated little “Splinter Ships” and Eagle

Boats of the last war, through the personnel that mans the entire gamut of converted yachts, tiny coastwise protectors, the ships of the Coast Guard, the PC's, the YP's, the PG's, the SC's, and the Destroyer Escorts, are thousands of men of our "new Navy," fighting alongside other American sailors who wear from one to seven Hash Marks.

Each and every one is a true descendant of the "iron men in wooden ships" who fought America's sea battles of yesterday, who established the things that, today, we are battling to keep. Well may the shades of John Paul Jones, Oliver Hazard Perry, David Glasgow Farragut, and other American naval immortals stand at rigid and respectful attention as the world's greatest crew of sub-busters mans its fleets of sub-busting ships and aircraft in the course of the continuous, often monotonous, always dangerous business of hunting and sinking enemy submarines.

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